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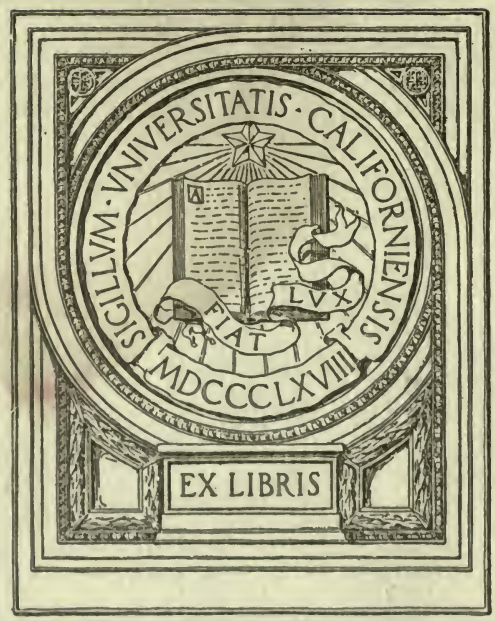

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UNIVERSITY LECTURES

ON

PHONETICS.

DELIVERED IN JOHNS HOPKINS UNIVERSITY, U. S. A., AND OXFORD UNIVERSITY, ENGLAND,

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With an Appendix on the Printing of Roman Letters.

BY

ALEXANDER MELVILLE BELL,

AUTHOR OF

"VISIBLE SPEECH," "SOUNDS AND THEIR RELATIONS," "PRINCIPLES OF SPEECH," "PRINCIPLE OF ELOCUTION," "ESSAYS AND POSTSCRIPTS ON ELOCUTION," ETC., ETC., ETC.

EDGAR S. WERNER, NEW YORK,
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EDGAR S. WERNER, NEW YORK,
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B. I. Wheeler

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PREFACE.

These Lectures were received with so great favour on their delivery in Johns Hopkins University (February, 1885) that their publication may be expected to excite an interest in their subject among students and teachers generally.

The Lectures were subsequently delivered — on invitation of Professor Max Müller—in the Taylor Institution, Oxford University.

The Physiological Symbols for speech-actions and sounds—originally introduced in "Visible Speech"—are here made use of to teach the varieties and the mechanism of linguistic elements, with a precision not otherwise attainable. The symbols themselves will, it is hoped, be so thoroughly understood, as to be easily applied, either to native or foreign sounds. By means of these unambiguous phonetic letters, the exact characteristics of any utterance, in any language, are expressible with universal legibility.

Teachers are specially invited to test the effect of using the symbols in black-board illustrations. A discriminating knowledge of the various sounds of ordinary letters, and other phonetic niceties, will be, in this way, effectively communicated even to the youngest classes.

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LECTURES ON PHONETICS.

I.

I trust that I shall be able to interest you in the subject on which I have undertaken to deliver a short course of Lectures—namely, PHONETICS. I had the honour of receiving the invitation—a renewal of which brings me here*—a dozen years ago, but I have been unable to take advantage of it until now, in consequence of my continued absence from England.

The subject of Phonetics was my special study for a great many years; and, if I should happily succeed in inspiring you with something of my own feeling in regard to it, you will not be deterred by initiatory detail, but will prosecute the study in the love of it, and for its utility, long after our meetings shall have come to an end.

The term Phonetics signifies the doctrine of sounds in general; but the use of the term is commonly and conveniently limited to the elementary sounds of speech, and their representation by letters. I shall give a somewhat wider definition, by including *all oral effects in speech, and their graphic representation.* In this way, hiatus, and other silent effects, and also tones, are comprehended under Phonetics.

All human utterances may be resolved into elementary sounds, or oral actions; and all the varieties of phonetic elements in different languages, are the result of definite mechanical adjustments of the organs of speech. The organs are the same in all men; and, consequently, every person possesses naturally the ability to speak any, or every language.

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* The University of Oxford, where the Lectures were delivered in April, 1885.

The speaking apparatus consists, first, of a reservoir for air; secondly, of a reed for forming sound; and, thirdly, of a resonance-box, susceptible of a great variety of modifying configurations. The air reservoir is in the chest—the lungs; the reed is in the throat—the glottis; and the resonance box is made up of the cavities between the throat and the lips—the pharynx, with its outlets, the mouth and the nose. By considering the instrument of speech in this simple manner, we shall gain a clearer idea of the mutual relations of the organs of respiration, voice, and articulation, than we should by the most exact study of the structure of the organs themselves. Thus, the air reservoir may be too contracted, or it may be insufficiently charged; the reed may be out of order; or some part of the resonance-box may be leaky; and certain kinds of imperfection in utterance will necessarily follow.

Speech elements are of three classes:

I. Those produced by *voice.*
II. Those produced by unvocalised *breath.*
III. Those produced by the *mouth.*

Each of these classes includes several varieties. Thus:

Voice-elements include: Vowels, Consonants, Glides, and Tones.

Breath-elements include: Vowels, Consonants, and Inhalations.

Mouth-elements include: Cavities, Percussions, and Suctions.

For practical purposes, the most important sounds are those which make up ordinary speech. These, therefore, will occupy the largest share of our attention.

All the varieties above named—except Inhalations—occur among the common elementary sounds of languages; but, for the most part, they are very inadequately represented in

writing. Glides have no distinctive signs; Tones are seldom expressed; and Vowels and Consonants are so insufficiently provided with letters that innumerable inconsistencies of spelling are the result. The same alphabet is, besides, used for many languages, and the letters are differently employed in each language. The characters, indeed, may be said to be international, but their phonetic value changes at every national boundary. Practically, therefore, each language has its own alphabet.

The inconvenience of such diversity has impelled generations of scholars to much fruitless labour in endeavours to arrange an alphabet adapted for international employment. A universal alphabet that should furnish a distinct character for every sound had long been a dream of Philology; but this difficulty prevented its realisation, namely: That the ultimate elementary sounds of languages baffled investigation; while, of the comparatively small number of sounds respecting which there was agreement, the relations of the sounds to each other could not be satisfactorily determined. Many speech-sounds are modified by such minute and occult organic changes, and are so evanescent in their nature that even a trained ear can with difficulty identify them in their combinations. The same sound seems to have a different quality in new positions; and really differing sounds seem to merge into one, under the influence of associated elements. We have all learned to speak by imitation merely; acquiring by single perceptions a knowledge of words, the utterance of which involves very complex organic operations; and the latter are performed entirely by habit, and without any consciousness of the mechanisms on which we act. Besides this, the letters by which we write our words have little—or, sometimes, no—relation to the sounds they represent. In fact, if all the letters of the alphabet were shaken together in a bag, and the first drawn out were called A, the second B, the third C, and so forth, they would serve

the purpose of denoting the elements of speech almost as well under this chance arrangement as they do now.

In 1854 a concerted effort was made to collate the elements of an international alphabet by a conference of the leading philologists of Europe, which was held in London under the presidency of the Russian ambassador, the Chevalier Bunsen. After four deliberations the attempt was abandoned, because no more than seventeen sounds—and those the commonest in all languages—could be agreed on as sufficiently definite for inclusion in the proposed alphabet. The want of a physiological basis was declared to be the insuperable impediment to the construction of an international scheme. To this declaration was added, as the final and unanimous Resolution of the Conference, that "it would be useless and impossible to attempt to provide for every shade of sound a distinct graphic sign." The recommendation was that—typical letters being selected—each nation should adopt to represent its peculiar sounds the letters whose ordinary phonetic values most nearly resembled the sounds to be denoted. In the then existing state of the highest knowledge of Phonetics, as expounded by this learned Conference, the provision of a separate sign for every recognised shade of sound was declared to be an impossibility. In the absence of a physiological basis, such a literation of sounds was, no doubt, impossible; but the physiological basis might be found. In a very few years afterward it was found; and the previous impossibility became entirely practicable. For, not only every linguistic element, but every possible shade of sound—every action, and even every silent position of the vocal organs—has on this basis, its own distinct graphic sign.

The operative vocal organs are: the lungs, to supply breath; the glottis, to vocalise it; the pharynx, to compress it; the tongue and the lips to parcel it; and the cavities of pharynx, mouth, and nose, to mould it. What of the teeth?

Are they not operative? In mastication they are so, but not in speech. There we have simply to keep them out of the way. Notwithstanding the fact that grammarians have used the term "dentals" to denote a whole class of elementary sounds, there is not an element that cannot be distinctly formed by a speaker who has not a tooth in his head. The sound of *th* is the one in which the teeth are the most obviously employed; but the characteristic quality of *th* may be produced with the tip of the tongue applied to any accessible part of the mouth—to the palate—to the gum—to the teeth—or even to the lips.

A fundamental question is: What constitutes a word? Is it the uttered sound, or the letters by which the sound is represented? In English, it is both. The sound is the primitive word, but the letters by which the sound is written constitute a separate pictorial word. Thus, the words *night* and *knight* have the same sound, but they are two words, having no connection in sense. Almost every English sound has a diversity of modes in which it is written; and this diversity contributes to the pictorial distinctiveness of words. Herein lies the source of the objections so commonly urged against alterations in spelling: they destroy the identity of pictorial words. But the sounds of words—that is, the primitive words themselves—have changed; and they are constantly changing to a greater or less extent; while the pictorial words have, since the universal diffusion of literature through the printing press, become generally fixed.

Mr. Alexander John Ellis has devoted much ingenious research to the discovery of the details of English pronunciation as heard in the days of Chaucer and of Shakespeare. The regular sound of A was then *ah*; so that what we call "and" was *ahnd*, "face" was *fahs*, "Shakespeare" was *Shahkspare*, &c. The letters ew, which we pronounce ū in *view*, oo in *drew*, and o in *sew*, were uniformly heard, in

accordance with the spelling, as ĕ-oo. Thus, *new* was nĕ-oo, *drew* was drĕ-oo, *sew* was sĕ-oo. Our "short" ŭ was sounded oo, as in oos and oop for *us* and *up*; and our "long" ū, as in *tune*, *music*, *mule*, was the same as the German ü—a sound which has dropped entirely out of our language. Thus, in the Shakespearean theatre, the line

"Mewling and puking in the nurse's arms,"

was heard as:

"Mĕ-ooling ahnd püking in the noorse's arms."

The general effect of Shakespearian English, as reproduced by Mr. Ellis, is very like the pronunciation still lingering in some of the counties of England, and in the lowlands of Scotland; although modern intercourse and education are fast obliterating old customs of speech. These modes of provincial English, and of Scottish utterance are, doubtless, with very slight changes, the modes in which the language was pronounced by the best speakers in the days of Queen Elisabeth. Look at the spelling of words, as practised then, and in earlier times: it is altogether unsettled and arbitrary; the same writer often spelling the same word in a variety of ways. Even Shakespeare, we are told, spells his own name—so far as it is decipherable—in almost as many ways as we have specimens of his autograph. When we look at the works of the fathers of our literature, we must admit that there can be but little force in the objections made to alterations in our present spelling. One might as well maintain that the spelling of the Elisabethan age should be the standard for our orthography in all time. Why select the present period to furnish a standard? Its only claim to the distinction is that it is an age of books, and magazines, and newspapers—and readers; and that any change now made would be felt by perhaps hundreds of thousands, for every single reader who would have been affected by

a change, in the time of Chaucer or even of Shakespeare. Objections to any desirable and consistent change are, in view of the historic facts of orthography, altogether groundless. If the written word can be made to correspond with the spoken word, the mere pictorial alteration is unworthy of much consideration.

But the question arises: Can we, *with our present alphabet*, phoneticise English spelling? Undoubtedly we can not. Any attempt to do so leads to anomalies and inconsistencies almost as great as those to which existing orthography is subject. Even the common-sense procedure of dropping silent letters only destroys pictorial identities, without effecting a phonetic improvement in the general character of our writing.

For example, the *l* in *could* might be dispensed with: but where would be the phonetic consistency of writing c o u d for *could*, while we use l o u d for *loud*? Suppose this anomaly to be obviated by changing ou to ow in the last word—to make it match with *crowd;* where would be the consistency of writing *ow* for the vowel in *loud*, while we use the same letters to represent the different vowel in *own* and *know*? Every single alteration necessitates a host of others, without the possibility of attaining consistency after all. Our alphabet does not contain letters for much more than one-half of our sounds, and new letters are indispensable to success in any attempts to phoneticise our general spelling.

For whose benefit are we asked to amend our orthography? For the benefit of children, and of foreign learners of our language. But experiments have abundantly proved that the difficulties of initiation can be overcome by special methods of instruction, and without disturbance of spelling. In the phonetic system introduced under the joint authorship of Ellis and Pitman, some forty years ago, new letters were added to the alphabet and spelling was made

accordant with sound. For initiatory purposes, the method was excellent, as it enabled learners to read in a very short space of time, while the transition to reading from ordinary books was effected almost unconsciously by the learners themselves. In another phonetic system, from which results of almost equal value were obtained, new letters were altogether dispensed with. This method was introduced by myself, over thirty years ago, in a little book entitled "Letters and Sounds." The principle then illustrated has since been imitated in books now extensively used in schools, under the name of the Leigh system. The principle was to print every letter of the full orthography in order to accustom the eye to the pictorial aspect of words, but to show silent letters in a different type from that of the sounded letters. For this purpose, silent letters were printed in small "superior" type—that is, type standing above the general line. Thus:

a^{i}m, le^{a}f, ri^{gh}t, ^{k}no^{w}, du^{e}.

In the Leigh books the silent letters are shown in thin skeleton type, instead of "superior" letters.

Each of these three methods—namely, the Pitman-Ellis extended alphabet, the "superior" silent letters, and the skeleton silent letters—has been found to work well, both with children and adults. Now, if such partially phonetic modes of initiation have been proved to be advantageous, surely much more advantageous would be a completely phonetic introduction to reading, by means of special letters. When learners have become sufficiently acquainted with the phonetic characters to translate them readily into sound, a key is possessed to the pronunciation of words printed in the ordinary way, and such words will then be learned from their pictorial aspect alone—as wholes—and without

the bewildering and unphonetic preparatory analysis of a b *ab*, e b *eb*, &c.

Another, and the crowning, advantage of a completely phonetic initiatory system is, that it enables learners to read the words of any language with equal facility. You may put a French, a German, an Italian, or an English book into the hands of a learner initiated in only one language—say English—and he will read the other languages with full intelligibility to native speakers. Nations are no longer insulated, as in the days preceding steam navigation, railroads, telegraphs, and telephones; and facility of intercourse by language as well as by transit, is a demand of the age, which calls more and more imperatively for some common medium of intelligibility.

All the efforts made by phoneticians for the improvement of English spelling would not help an English learner to a more easy acquaintance with foreign sounds. Yet this should be a chief aim in any proposed alteration. A change which does not assimilate the writing of our own language to that of other languages, or which does not facilitate speech-reading between nations, is not worth striving for. So far as our own language only is concerned, we can overcome the impediments to its acquisition—as has been shown—by a partially phonetic method of teaching common letters in our primary schools; but we should remember that in our schools we are training not only citizens of our own country, but citizens of the world. Even the youngest of the classes will very soon be dispersed throughout lands where alien tongues are spoken; and we should, therefore, aim at making speech-initiation phonetic in the widest sense. Children should, from the first, be trained not only in the pronunciation of native sounds, but of all linguistic sounds. The mouth and its adjustments should be the object-lesson; and it would be one as simple as delightful to the youngest pupil, while,

at the same time, it would be fraught with high importance for the future.

The number of Alphabets that a student of Comparative Philology has to master is an immeasurable drawback to the progress of the science. To say nothing of the Hebrew, the Greek, the Russian, the Persian, and other Eastern alphabets, Roman letters alone furnish many distinct systems. A pamphlet recently issued by the American Bible Society contains specimen verses printed in 243 languages. About 120 of the alphabets illustrated are varieties of Roman letters; yet no reader of any Romanically written language can pronounce these specimens—or any one of them—merely from the writing. The Missionary Societies have several Romanic arrangements; the American Ethnological Bureau has its own separate scheme; English literature has another; French literature another; and there is not in use in all the world an Alphabet adapted for international employment.

The system which I shall now have the honor of explaining constitutes a Science of Phonetics—an indispensable helpmeet to the Science of Philology. The physiological letters are not intended to displace any other alphabet, but to be used as a key to all alphabets. In this way they have already been found of unique value to students of languages. Their introduction into Primary schools has not yet opened up this widest field of usefulness; but there can be no doubt that the physiological alphabet will prove the readiest means of enabling children to read their mother-tongue. Our literature will, probably for a long period, continue to wear its homespun garb of letters, at home; but languages should be provided with a traveling phonetic suit to wear when they go abroad. A completely different alphabet for phonetic purposes has this advantage, that it raises no prejudice on the part of scholars, while changes of orthography, or new uses for

old letters, are deprecated by many, and favoured by comparatively few.

The number of sounds discriminated in languages is now much greater than it was when alphabets were first introduced. A mere indication of the position of the principal vowel in a word, without distinction of qualities of sound, even now suffices for intelligibility in the writing of a familiar tongue. The English language abounds in words of the same primitive meaning, but which have come to be applied to different thoughts, or shades of thought. In this way, words etymologically the same are by no means synonymous in use. Refinements in the use of words have led to refinements of phonetic apprehension, so that syllables which were, at first, sufficiently discriminated by one of the primitive vowels A E I O U would be no longer distinguishable without an indication of intermediate shades of sound.

In treating of phonetic elements, all associations with letters must be discarded. We have to deal with sounds alone. But we must have some means of representing each element, to enable us to identify the sound without ambiguity. For this purpose there is no other existing means than the symbols of "Visible Speech." These mathematically phonetic letters are so related to each other, and to the organic positions which produce their sounds, that the reader sees the formation of every sound in its symbol. The entire alphabet—although consisting of upwards of 50 consonants and 36 vowels—requires but a single explanation to enable the learner to *name* every character. The name describes the organic position depicted in the symbol, and the assumption of the described position by the organs of speech necessarily produces the sound of the element. Practical facility, of course, depends on individual aptitude and application; but the symbols themselves become teachers after the student has been once initiated

in their names. My object to-day is simply to enable you to take this initiatory step. I shall present in one view the whole amount of phonetic variety, in connection, not with the sounds, but with the names of the symbols. An idea will thus be obtained of the various phonetic elements in advance of the ability to produce the sounds.

Straight Lines.—A straight line is the symbol of Voice. The line depicts the linear aperture of the glottis when in the act of forming voice.

Vowels.—Vowels, being formed of voice, are all represented by straight lines. Individual vowels are differentiated by the position of an auxiliary symbol attached to the vowel line. Thus:

	Back	*Mixed*	*Front*
High	˥	˦	˩
Mid	˩	˥	˩
Low	˩	˦	˩

The position of the auxiliary symbol on the left is called "Back"; on the right, "Front"; and on both sides of the line, "Mixed." The position of the auxiliary at the top of the vowel line is called "High"; at the bottom, "Low"; and at both ends, "Mid."

The names of the above nine vowels—all the radical varieties—are, then:

˥ High Back; ˩ Mid Back; ˩ Low Back.

˦ High Mixed; ˥ Mid Mixed; ˦ Low Mixed.

˩ High Front; ˩ Mid Front; ˩ Low Front.

Another class of vowels, slightly different in quality from the above "Primary" vowels, are distinguished by an open

hook, instead of a solid point, attached in the same positions to the straight line. All vowels of this class are called "Wide." Thus:

ɪ High Back Wide; ᵻ High Mixed Wide; ɾ High Front Wide.

ɔ Mid Back Wide; ɤ Mid Mixed Wide; ɕ Mid Front Wide.

ɾ Low Back Wide; ɻ Low Mixed Wide; ɹ Low Front Wide.

The only remaining vowel symbol is a bar across the straight line. The name of this symbol is "Round." The nine Primary vowels and the nine Wide vowels, as above, are all repeated with this barred stem. Thus:

ɨ H. B. Round; ɨ̞ H. M. Round; ɨ̟ H. F. Round.

ɘ Mid B. Round; ɵ Mid M. Round; ɞ Mid F. Round.

ɤ̈ Low B. Round; ɤ̞ Low M. Round; ɤ̟ Low F. Round.

ɪ̈ H. B. Wide Round; ᵻ̞ H. M. Wide Round; ɾ̟ H. F. Wide Round.

ɔ̈ M. B. Wide Round; ɤ̞ M. M. Wide Round; ɕ̟ M. F. Wide Round.

ɾ̈ L. B. Wide Round; ɻ̞ L. M. Wide Round; ɹ̟ L. F. Wide Round.

The reader should, at this point, exercise himself in naming each of the thirty-six vowels, as they are collected in the following Table:

ɪ	ᵻ	ɾ	ɪ	ᵻ	ɾ
ɔ	ɤ	ɕ	ɔ	ɤ	ɕ
ɾ	ɻ	ɹ	ɾ	ɻ	ɹ
ɨ	ɨ̞	ɨ̟	ɨ	ɨ̞	ɨ̟
ɘ	ɵ	ɞ	ɘ	ɵ	ɞ
ɤ̈	ɤ̞	ɤ̟	ɤ̈	ɤ̞	ɤ̟

Curves.—Curved lines depict the outline of the tongue and of the lips, as seen when the face is turned to the right. Thus:

C Outline of the back of the tongue.

∩ " " top " "

∪ " " point " "

Ɔ " " lips.

Consonants.—Consonants being formed by positions of the tongue or the lips are denoted by the curves which represent the part of the mouth employed in forming the consonant. The above four curves are named, as consonant elements:

C Back. ∩ Top. ∪ Point. Ɔ Lip.

The mechanical varieties of consonants are differentiated by auxiliary symbols joined to the organic curves. Thus, small curves joined to the ends of the principal curves exhibit a "mixture" of opposite curves with the one in sub ordination to the other. These symbols are named:

ɕ back mixed; ɲ top mixed; ʊ point mixed; ɔ lip mixed.

For another class of consonants, the curves are indented, or "divided" in the middle. The four symbols of this class are named:

ɛ back divided; ɱ top divided; ω point divided; ɜ lip divided.

"Divided" consonants may be also of "mixed" formation. The four compound symbols of this class are named:

ɛ back mixed divided; ɱ top mixed divided;

ɯ point mixed divided; ɜ lip mixed divided.

For another class of consonants, the curve is closed by a thin line drawn across its ends, to symbolise the "shut." position of the organs. The four letters of this class are named:

ɑ back shut; ɑ̱ top shut; ɒ point shut; ɒ̱ lip shut.

In the next and last of the organic consonant symbols the curve is also closed, but a waving line (the sign of nasality) is added to the line of closure. The names of the four resulting compound symbols are:

ɠ Back nasal; ɑ̃ Top nasal; ʊ̃ Point nasal; ɔ̃ Lip nasal.

Twenty-four consonant symbols have now been evolved from the four organic curves, c ɔ ʊ ɔ. The reader, before proceeding, should exercise himself in naming each of the twenty-four symbols, as collected in the following table:

c	ɕ	ɛ	ɛ	ɑ	ɠ
ɔ	ɑ̃	ɱ	ɱ	ɑ̱	ɑ̃
ʊ	ʊ̃	ɯ	ɯ	ɒ	ʊ̃
ɔ	ɔ̃	ɜ	ɜ	ɒ̱	ɔ̃

The twenty-four consonants exhibited above are at once converted into forty-eight, by the addition of a straight line—the sign of voice—drawn within each of the curves.

The names of the resulting symbols simply add the word "Voice" after the names already explained. Thus:

ɐ back voice; ɐ̈ back mixed voice.

ɛ back divided voice; ɛ̈ back mixed divided voice.

ɐ̆ back shut voice; ɐ̃ back nasal voice.

The reader should now exercise himself in naming all the Voice Consonants, as collected in the following table:

ɐ	ɐ̈	ɛ	ɛ̈	ɐ̆	ɐ̃
ɱ	ɱ̈	ɱ	ɱ̈	ɱ̆	ɱ̃
ɷ	ɷ̈	ɷ	ɷ̈	ɷ̆	ɷ̃
ɜ	ɜ̈	ɜ	ɜ̈	ɜ̆	ɜ̃

It may not be superfluous to point out that this entire scheme of physiological letters for thirty-six vowels and forty-eight consonants is made up from only nine elementary symbols; namely, the two vowel stems (| ɬ), to which the two definers (· ∩) are attached; and the two consonant stems (c ɛ), to which the three definers (ʒ | ʕ) are attached.

Other combinations of these nine radical symbols represent a series of "Glides"; and four auxiliary signs, to be afterwards explained, extend the total number of possible elements so that it includes the minutest shades of phonetic difference.

A few remaining symbols in the Universal Alphabet will be the subject of future explanation. Meantime, familiarity with the names of the symbols should be obtained; the advantage of which will be felt in the subsequent translation of the names into phonetic action, or sound.

LECTURES ON PHONETICS.

II.

At the commencement of the preceding Lecture speech-sounds were divided into the three classes:

Voice Sounds.
Breath Sounds.
Mouth Sounds.

Vowels are all voice sounds in ordinary speech; and they are breath sounds in whispered speech. Such consonants as *m*, *n*, *l*, *v*, *z*, are voice sounds; and such as *f*, *s*, *sh*, are breath sounds. Another variety of voice sounds—namely, Tones—includes those expressive turns of the voice which add to language a meaning beyond that contained in words.

Mouth sounds constitute a class which has not hitherto been discriminated. Vowels and consonants are mouth sounds, in so far as the breath or voice which they employ is moulded by the varying cavities of the mouth. But certain elements of speech are produced by the mouth alone, and without the emission of either breath or voice. These are percussions and suctions. The percussive effects of consonants are heard in their greatest purity in the sounds of the letters *p t k*. The percussion in these consonants may be accompanied with issuing breath, or it may have any amount of audibility without emission from the chest. In the latter case the percussiou is derived from the mouth cavities and the pharynx—the distensible cavity behind the tongue. This is a point of great practical importance both to speakers and singers; for when the percussion is the result merely of muscular contraction the purity of the voice is not affected by any amount of percussive energy.

The remaining class of Breath sounds—Inhalations—are

not used in speech, except interjectionally: as *f*< (with inspired breath) for *pain; wh*< for *surprise.* The remaining class of mouth sounds—Suctions—as *p*<, *t*<, *k*<, are common elements of speech in some languages, as well as interjectional sounds among all people. Something more will be said of these varieties when we come to phoneticise the consonant symbols.

In the remarks on Shakespearian pronunciation, in last lecture, the effect was stated to be very like that of existing provincial dialects. This is especially true in regard to lowland Scotch, which is very rich in sounds. The Scottish dialect contains the German guttural consonants, and also the French and German vowels. When the sounds of modern English are added, a category of phonetic elements is made up equal to that in almost all the European languages. I was early familiar with this amount of phonetic variety, and the problem which I set myself to solve at the beginning of my professional career was to represent these Scotch and English sounds, and shades of difference in such a way that a Scotchman should read English, and an Englishman read Scotch, with native effect. This problem took a wider scope as the efforts at its solution progressed, until, ultimately, my aim included the whole range of possible phonetic elements.

I had been accumulating for some time a considerable category of sounds, including the accidental utterances of stammerers and other defective speakers. These were all carefully noted, because every such sound might prove to be an element in some unknown tongue. Key-words were used, when practicable, to recal the various sounds; otherwise, the name of the individual in whom the sounds had been observed had to do temporary duty for a nomenclature. Such was the first form of the physiological alphabet.

These facts are recalled for the purpose of showing that, at the time referred to, few of the now universally ack-

nowledged relations of sounds had been discovered. The mind becomes fascinated by any pursuit that leads to untrodden paths of inquiry; and many years were devoted to the self-imposed labour of love, in investigating and classifying every sound which could be discriminated. Certain elements fell one by one into place in the growing general scheme; but other elements were refractory, so that there were gaps in the scheme waiting for occupation, and fleeting sounds in the brain waiting for a resting-place and long finding none.

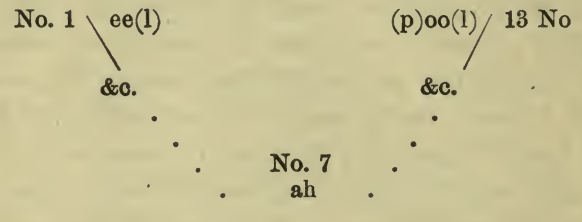
In 1849, the system which had been thus gradually elaborated was published under the title of "A New Elucidation of the Principles of Speech and Elocution." This work contained a partial development of what proved ultimately to be an important and pregnant fact; namely, that so-called "labial" vowels are the result of a double organic arrangement, each of them being the same in formation as one of the lingual vowels, to which labialisation is simply superadded. But this fact was not seen in all its bearings for some years subsequently. For example, the vowels were at first arranged in three classes, named, respectively:

Lingual	*Labio-Lingual*	*Labial*
.	.	.
.	.	.
.	.	.
.	.	.
.	.	.

but the truth became afterwards manifest that such a category as Labial vowels did not exist, and that every Labial vowel was, in reality, Labio-Lingual. This led to the analysis of the English Labials—*oo*, *oh*, *aw*—and to the discovery of the lingual vowels that had hitherto lain hidden behind these elements. The labio-lingual theory thus contained the germ that in time developed into the classification on which the physiological system of letters is based.

The Vowel Scheme, in 1849, included twenty-two elements; the "Visible Speech" Scheme, published in 1867, contains thirty-six vowels. The names of all these were explained in former Lecture.

In the first work, above referred to, the English vowels were separately classified, and were considered as thirteen in number, exclusive of diphthongs. These sounds could not be unambiguously denoted by letters; and therefore they were simply arranged serially in a table and numbered from 1 to 13; the number of each vowel being used as its name, and also as its graphic representative. Thus:



The twenty-two vowels in the General Scheme were also numbered from 1 to 7 in each of the three classes, *Lingual*, *Labial*, and *Labio-Lingual*; and the number 8 represented the sound [*ah*] in which each class terminated when the maximum expansion of the mouth was attained. Thus, in this nomenclature, *ee* was No. 1 *Lingual; oo* was No. 1 *Labial;* and ü [German] was No. 1 *Labio-Lingual.*

The principle of numerical notation proved to be a happy expedient, as it enabled learners to master the sounds, as well as the theory of their formation, with a readiness that no arrangement of letters could have accomplished. But the plan was only a makeshift, and too cumbrous for general adoption—for which, indeed, it was never intended. If the assignment of ordinary letters to represent the 22 vowels in the General Scheme, or the 13 vowels in the English Scheme, was impracticable, what could have been done

with our five vowel letters, a e i o u, to represent the 36 vowels afterwards distinguished? Or, how could I now hope to give you a clear perception of all these sounds, if I were limited to Roman letters for their representation?

Mr. A. J. Ellis, in his "Glossotype"—which is simply another name for Visible Speech—makes use of the ordinary alphabet by inverting and combining the letters, to denote the physiological elements; but the symbols being arbitrary, a hopeless burden is imposed on the learner's memory, and constant reference has to be made to key-words to ascertain the intended sounds. Mr. Ellis's object was to furnish a means of exhibiting the Visible Speech phonetic elements by letters to be found in every printing-office; but the very idea of *visible speech*—that is, letters which show, in themselves, the organic formation of the denoted sounds—is lost in the attempt. The convenience of readers, in fact, requires a translation of the Glossotype into the physiological letters which it was designed to supersede.

The alphabet used by the Ethnological Bureau, in America, for the writing of Indian languages, consists of Roman letters varied by diacritic marks, inversions, and combinations; but the scheme is very far from being complete. Glossotype might be used for writing any language or dialect, but the Ethnological alphabet could not phoneticise with accuracy English and German alone.

As this is one of the most recent arrangements of Roman letters for extra-English uses, I have examined it with care, in order to ascertain the number of physiological elements included in the scheme. I find that the total number of its vowels is thirteen, and the total number of its consonants twenty-six. Of course, the broadest distinctions among the sounds of each class are represented; but these only. Incompleteness is, however, acknowledged by the extraordinary supplement of twenty-four inverted letters to be used *ad libitum* "for sounds not provided for in the

alphabet." Such a method is, manifestly, incapable of international use.

True phonetic writing should be translatable into sound with such definiteness that a person of any nationality could read from it his own or any other tongue, with native effect. For such writing, ordinary letters cannot be employed, nor could they be adapted for it by any arrangement or modification. When we speak of phonetic writing, therefore, we must always clearly distinguish between two things; namely, the writing of any one language and the writing of different languages internationally.

Objections are constantly urged against the introduction of new letters, or of altered modes of spelling. These objections are intended merely to deprecate interference with established usage; but they are made to bear directly against the principle of phonetic writing, and in this respect they are absurd; for the primitive purpose of alphabetic writing was, undoubtedly, to show the sounds of words. This fundamental fact should, once for all, be acknowledged: that, while we may have phonetic writing—national and international—without disturbing orthography—that is, by means of a separate alphabet—we cannot possibly have phonetic writing in connection with established letters.

The descriptive nomenclature of the physiological symbols for vowels and consonants was explained in the preceding Lecture. The sounds of the symbols are now to be illustrated. We shall confine our attention, first to vowel sounds.

In forming any vowel the voice must be assumed to pass entirely through the mouth, and not partly through the nose. A slight depression of the top of the soft palate uncovers the end of the nasal passages, and allows the voice to pass both nasally and orally. This is the mode of formation of the French semi-nasal elements, *en*, *in*, *on*, *un*.

American speakers often give a nasal quality to their vowels. This is a great blemish which ought to have been corrected in the primary school, if not prevented in the nursery. The custom depraves the ear; so that the difference between purely oral and semi-nasal sound is not distinguished by the speakers themselves. To acquire the power of discrimination, pronounce the vowel *ah* slowly and observantly, while the soft palate is alternately depressed and elevated, and the cause of nasality will be distinctly felt, and seen, if the mouth be opened widely enough.

The American tendency to nasalise vowels is manifested chiefly when the vowel is preceded or followed by a nasal consonant [*m*, *n*, or *ng*]. In pronouncing such words as *am*, *in*, *me*, *no*, the soft palate has to close and open the nasal entrance with a celerity which we should think wonderful could we but see it. Organically it is much easier to say *am*, *in*, *me*, *no*, with nasalised than with purely oral vowels, and the habit of nasal utterance being formed, the soft palate becomes set to the position; so that all vowels are more or less tinged with nasality.

The precise quality of any individual vowel depends on the relative size of the cavities at the front and at the back of the mouth. When the whole mouth-cavity is expanded to the utmost possible extent, the voice [or breath] has the quality of the Low Back Wide vowel J [*ah*]. When the front cavity is contracted to the utmost possible degree consistent with a vowel aperture, the sound has the quality of the High Front vowel ſ [*ee*]. This latter—the narrowest of all vowel formations—is the natural starting-point of any general scale of vowels; and the sound of *ah*—the broadest vowel formation—is the natural termination of any such scale.

The top of the mouth is an arch, and the tongue may take an equally high position close to the front of the

arch, the top of the arch, or the back of the arch. There are thus three High vowels, ɪ ɪ̈ ɪ

The High Front vowel ɪ [*ee*] is familiar in the mouths of all speakers of English, but the other High vowels are not so; and we have to analyse and combine other sounds in order to discover the quality of the unfamiliar elements. For example, the High Back vowel [ɪ] will be obtained by analysing the sound of *oo* (ʉ). The tongue is already in the High Back position when we pronounce *oo*; but the lingual quality is not distinguished because of the close position of the lips. In other words, *oo* is High Back sound, *plus* labial modification. Manifestly, therefore, if we can pronounce *oo*, *minus* labial modification, we shall hear unveiled the simple High Back quality. Try the experiment. Sound the vowel *oo*, and while doing so separate the lips—say with the finger and thumb—and every mouth will yield the same residual sound. Some little practice may be needed before the exact position can be struck spontaneously, but by commencing with *oo*, and delabialising that sound, the High Back vowel will always be at command.

The High Mixed vowel [ɪ̈] formed with the middle of the tongue close to the top of the palatal arch, has a quality intermediate to the sounds of the Back and Front High vowels. Just as by blending two colours a third is obtained which is different from either, so, by endeavouring to pronounce simultaneously a Back and a Front vowel, the sound of the corresponding Mixed formation will be produced. Thus:

$$ɪ + ɪ = ɪ̈$$

The High Mixed vowel is heard in the words *church*, *earnest*, *sir*, &c., as pronounced in America.

From these governing attitudes of the tongue, producing respectively Back, Front, and Mixed qualities of sound, we

can understand how it is that speakers often exhibit a peculiar organic colouring throughout all their vowels. The source will generally be traceable to some habitual position or motion—some set, as it were—of the organs of speech. Thus the vowels may be gutturally modified by abnormal retraction of the tongue, or by enlarged tonsils; or they may be labially or dentally modified by interfering positions of the lips, or interlocking of the teeth; or modified by a general indefiniteness of quality, arising from sluggishness of the tongue, and inability to shift to the requisite Back or Front positions. The latter characteristic is strikingly exemplified in the utterance of a celebrated English actor, whose artistic and scholarly presentation of plays attracts large audiences on both sides of the Atlantic, but whose pronunciation is deformed by a general indefiniteness of vowel quality throughout all his syllables. The actor referred to is Mr. Henry Irving, from whom the Mixed sounds may be studied in all their little variety, but who never, by any chance, pronounces a pure Back or Front vowel—a clear *e̅* or *a̅*, or *oo* or *o̅*.

From a knowledge of the formation of the three Primary High vowels, the sounds of all the thirty-six vowels may be deduced with practicable certainty. Thus: use each of the high positions as a starting-point, and, while sounding the voice continuously, keep the shape of the tongue unchanged as you gradually enlarge the cavity between the tongue and the palate. The quality of the sound will change with every movement; and, if you could give fixity to each of the various positions, you would have a separate vowel for every position. Our scale requires the discrimination of only three positions in each possible series; namely, the "high," the "mid," and the "low."

Try this experimentally. Start with ſ (ee) and keep the front of the tongue facing the front of the palate, while the front cavity is slowly enlarged by descent of the

tongue. A slight retraction of the highest point of the tongue will take place at the same time. Then, maintain the tongue in the high, mid, and low positions of this series, and these "fixed configurations" will yield the sounds of the three front vowels:

ʃ ee(l) ʅ a(le) ɭ e(ll)

Now take the high back position (l) as a starting-point, and keep the back of the tongue facing and close to the soft palate, while the back cavity is slowly enlarged by descent of the tongue. The high, mid, and low positions of this series will yield the sounds of the three back vowels:

l] ɟ

The first is a delabialised *oo*; the second a delabialised ō; and the third a delabialised *aw*.

Start now with the high mixed position (ɪ̈) and gradually enlarge the mouth-cavity by descent of the tongue while its shape remains unchanged. Give fixity to the configurations at the high, mid, and low positions in this series, and the sound of the three Mixed vowels will be heard:

ɪ̈ l ɪ̲

The first is the American sound in the word *church*; the second the German sound of *e* in alte, neue, &c.; and the third a provincial English sound heard in the Cockney huckster's pronunciation of the word *penny* (half way between *penny* and *punny*).

The sounds of the Primary Round vowels come next to be illustrated. The bar across the stem of the sym-

bols denotes modification of the sounds by contraction of the lips. The three High Round vowels have each a narrow labial aperture, like that of *oo*; the Low have a broad labial aperture, like that of *aw*; and the Mid have an intermediate aperture, like that of *o*. The sounds of the Back Round vowels are familiar to all speakers of English:

ɨ oo ɨ ō ɨ aw

These sounds will now be used with advantage, in acquiring, by simple delabialisation, as before explained, the exact positions for the unfamiliar primary Back vowels.

The Front Round vowels are all foreign sounds to a speaker of modern English; but they are mastered without any difficulty by means of the familiar primary Front vowels. Thus: pronounce *ee* (ɪ) with the lips in the narrow Round position, as for *oo*, and the result is ɨ; pronounce *ā* (ɪ) with the lips in the mid Round position, as for *o*, and the result is ɨ; pronounce ĕ(ll) (ɪ) with the lips in the broad Round position, as for *aw*, and the result is ɨ. These Front Round vowels are common French and German sounds. Thus:

ɨ ü Ger.; ɨ û Fr.; ɨ ö Ger., eu Fr.

It is important to notice that the Rounding effect does not involve pursing of the lips, or pushing them out like a funnel, but merely contraction of the labial aperture. In fact, the covering of the mouth with the hand gives a fair imitation of labial rounding.

The Mixed Round vowels are not so easily mastered by labialising the primary sounds, simply because the latter are themselves unfamiliar to an English speaker; but, by endeavouring to blend the Back and the Front sounds,

the Mixed Round vowels will be produced with sufficient accuracy. Thus:

oo (ɫ) and ü (ƒ) blended yield ɫ̣
ō (ɟ) and û Fr. (ƒ) " " ɫ
aw (ɟ) and *eu* (ɫ) " " ɫ̣

The first of these Mixed Round vowels (ɫ̣) is a common sound in the north of Ireland, heard instead of *oo* in *look*, &c; it is also the Swedish sound of *u*. The second (ɫ) is heard in French, in the word *homme*; and the third (ɫ̣) is the initial element in the Irish dipthongal sound of *ī*, as in *I mind, mind* your *eye*, &c.

Command over the whole gamut of vowels depends on perfect appreciation of the radical varieties, and chiefly of the three primary High vowels (ɿ ɿ̄ ʃ), from which the sounds of all the others—including Round and Wide varieties—are deducible.

In connection with Shakespearian pronunciation, the fact was referred to that the Front Round vowel (ƒ) had entirely dropped out of modern English. The process by which the sound of ü became changed into that of ū may be plausibly explained. Just as *oo* (ɫ) and ō (ɟ) are now analytically pronounced by many persons as ɿɫ, in *do*, &c.; ɿɟ, in *no*, *don't*, &c.; so the sound of ü (ƒ) we may suppose was analysed into ʃƒ, ʃɫ̣, or ʃɫ; in one of which forms we still hear it pronounced in America, in such words as *new*, *due*, *tune*, *few*, &c. The English habit of contracting ē (ʃ) into *y* (ɷ) changed ʃɫ into ɷɫ; and thus we naturally arrive at the English pronunciation of u; the steps being tüne, tēoon, tyoon.

The sounds of the Wide vowels will require but a comparatively brief explanation. The organic positions are practically the same for both sets of vowels. Wide vowels may be considered as merely loose and indefinite formations of the primary vowels. Thus:

The Wide variety of ɹ is J *ah*. A backward push of the tongue while sounding *ah* will change J to ɹ.

The wide variety of ſ is ſ ĭ(ll(. A forward push of the tongue while sounding ĭ will change ſ to ſ.

The sound of ɻ is ĕ(ll); and its Wide variety (ɻ) is ă as in *an. gas*, &c.

The sound of ɬ is *oo*, as in *food*; and its Wide variety (ɬ) is *oo*, as in *good*, or *u*, as in *pull*.

The sound of ɟ is ō, as in *old*; and its Wide variety (ɟ) is *o*, as in *ore*.

The sound of ɟ is *aw*, or *a* in *all*; and its Wide variety (ɟ) is ŏ, as in *on*, *or*, &c.

All the primary vowels resemble consonants in the closeness of their voice channels, as compared with those of the Wide vowels; and all the High primary vowels are convertible into consonants by a very slight organic appulse. The primary vowels are, as it were, strongly coloured by the organ which produces them; while the quality of the Wide vowels seems to be dulled, or diluted by a neutral tint of sound.

An exact knowledge of the cause of this neutral tint is not essential to a practical discrimination of the sounds. The same kind of difference will be felt in every case between the primary and the Wide varieties; and the difference is merely a sort of *in*difference in the pronunciation of the Wide, and of precision and firmness in the pronunciation of the primary vowels. An expansion of the back cavity of the mouth — chiefly by means of the soft palate—is the mechanical cause of Wide quality; but we may gain, perhaps, a clearer idea of the effect from another point of view.

When the tongue lies at rest, neither advanced nor contracted raised nor depressed, and the whole mouth-channel is perfectly relaxed, an utterance of voice produces what may be called the neutral vowel. This is the Mid Mixed

Wide vowel ɭ, heard in *a*lone, sof*a*, gener*a*l, &c. Previous illustrations will have familiarised the reader with what is meant by "blending" vowels. Apply this process, by blending the neutral sound ɭ with any primary vowel, and the result will be the corresponding Wide vowel. Thus:

ɾ + ɭ = ɾ

ɕ + ɭ = ɕ

ɪ + ɭ = ɪ

Practically, therefore, the mastery of the whole gamut of vowels depends on a thorough acquaintance with the formation of the nine primary sounds. All the others are derived from these in such a manner that the learner has only to know the *relations* of the sounds in order to discriminate the varieties. And the mutual relations of the sounds being all expressed in the symbols, the study of these will teach all that requires to be known.

A large proportion of the Wide vowels—fifteen out of eighteen—occur in our own language, either in its standard or its colloquial pronunciation. All of the unrounded, and six of the nine rounded Wide vowels are thus heard. In the following table the whole scheme of thirty-six vowels is illustrated; each Wide vowel being put in contrast with its corresponding primary:

		Round.	
Primary.	*Wide.*	*Primary.*	*Wide.*
ɾ eel	ɾ ill	ɬ über (Ger)	ɬ une (Fr
ɾ ail	ɾ air	ɬ dû (Fr)	ɬ school(Scotch)
ɾ end	ɾ and	ɬ peu (Fr)	ɬ now (Cockney)
ɾ church (Am.)	ɾ the	ɬ look(n. Irish)	ɬ -ful*
ɾ alte (Ger.)	ɾ sofa	ɬ homme (Fr)	ɬ -ow*
ɾ zur (Somerset)	ɾ sir	ɬ I (Irish)	ɬ -or*, Chicago
ɾ laodh (Gælic)	ɾ -tion*	ɬ pool	ɬ pull
ɾ up	ɾ ask	ɬ old	ɬ ore
ɾ up (Scotch)	ɾ ah	ɬ yawn	ɬ yon

Many of these sounds are extremely delicate in their varieties; but the characteristics of national, dialectic, and individual utterance depend altogether on just such nice distinctions as these. A careful reading of the above examples should satisfy the student of the reality of shades of difference in all of these thirty-six vowels. No one can expect to become perfect in phonetic practice without a considerable amount of exercise; but a sufficient knowledge of phonetic theory may be readily obtained to smooth the way for any after-application of the subject in connection with linguistic studies.

The sounds of the Consonants will be treated of in next Lecture.

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* Unaccented terminations, as *junction*, *awful*, *sorrow*, *mirror*.

Exercise on Vowel Words.

[ɨ* ee (eye, *Scotch*).

[ɨ { ae (one, *Scotch*).
eh! (interjection of surprise, *Sc*).

[ɨ ĕh! (interjection of reproach, *Sc*).

[ɨ ah! (interjection, *Irish*).

ʅɨ a " (drawling).

]ɨ uh! (interjection of horror).

Jɨ ah!

ɨɨ oo [wool, *Scotch*].

ɜɨ O! oh [*Scotch*].

ɟɨ awe.

[ʌ† A aye [ever] eh

[[aye [ever, *Scotch*].

]ʌ I, eye.

Jʌ ay [yes].

ɜɜ‡ O! oh, owe.

ɷɨ U, you, ewe.

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* The holder ɨ denotes a long vowel.
† The character ʌ is y-glide.
‡ The character ɜ is w-glide.

LECTURES ON PHONETICS.

III.

The previous lectures will have made sufficiently obvious the indispensability of specific phonetic symbols to convey an intelligible explanation of the varieties and relations of linguistic sounds. If the subject could have been treated in connection with common letters, I should have preferred to limit myself to the use of these; because prejudice is apt to be excited by anything unusual, however valuable it may be. I had occasion to experience this fact when I was appointed Lecturer on Elocution in University College. The Secretary of the College was commissioned to express to me the desire of the Board of Management that I would not give prominence in my teaching to my new Phonetic Scheme, then unpublished, but exciting a good deal of interest by its experimental applications. In consequence of this request I did not introduce "Visible Speech" in my lectures at University College during the years that I held the appointment. The Science of Phonetics—of which Elocution forms but one department—could not have been explained without the proscribed means. The very idea of a physiological alphabet was a novelty—novelty being in itself the reverse of a recommendation; and, as the scheme might or might not prove a credit to the University, the University desired to having nothing to do with it. My appointed subject here* being "Phonetics"—with no embargo on its illustration—I am able to make use of the new graphic help to a full elucidation of the subject.

At our last meeting, the sounds of all the vowel symbols were illustrated, and the differences of vowel quality—

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*Johns Hopkins and Oxford Universities.

often very minute—were shown to result from variations in the mouth, as governed by positions of the tongue, the lips, and the soft palate. These variations are only superficially denoted by the symbols. For example, the High Front vowel (ſ) derives its name from the visible position of the front of the tongue, but the sound depends on the relation between the cavities at the front and at the back of the mouth; the front cavity for ē being contracted in the greatest degree, while the cavity behind the raised part of the tongue is, at the same time expanded to its maximum size. And so with other vowels: the front and the back cavities of the mouth are both concerned in moulding the sounds. Into these particulars the symbols do not enter; because the most exact representation of the relative dimensions of the double cavities would not give a greater power of control over the formation of the sounds. If our object were to imitate vowels by mechanism, as in Faber's speaking machine, or as in Helmholtz's arrangement of resonance-boxes, the adjustment of the double cavities would be a matter of primary importance; but for our purpose of oral phonetics a recognition of the visible organic positions is alone sufficient.

The channel of the mouth, and also the formative aperture for every vowel must be free from interruption or constriction; otherwise the vowel is changed into a consonant. This is the characteristic difference between vowels and consonants. All consonants have an obstruction or compression of some part of the mouth-channel, producing an effect of friction, sibilation, buzzing, or intermittence of sound. Many of the vowels, therefore, give rise to consonants when their aperture is slightly compressed. This fact will be best appreciated by illustration and experiment. Thus:

I. Prolong the sound of the Mid Back vowel] (ŭ) and, while doing so, make a backward pressure on the tongue,

by means of a finger applied at the angle of the neck and chin, and the vowel will be changed into the corresponding Back Voice consonant, ϵ.

II. Prolong the sound of the High Front vowel ɾ (ē), and, while doing so, make an upward pressure on the tongue, by means of a finger applied under the chin, and the vowel will be changed into the Top Voice consonant, ɷ.

III. Prolong the sound of the High Back Round vowel ɬ (ōo), and, while doing so, make a slight appulsive action on the lower lip, by a gentle pressure of a finger, and the vowel will be changed into the Lip Mixed Voice consonant, ɜ (w).

IV. Prolong the sound of the High Front Round vowel ɾ (ü), and repeat the same action on the lip, and the vowel will be changed into the Lip Voice consonant, ɜ.

The last two experiments reveal the difference between the English *w* and the sound given to *w* by foreigners. The difference is merely in the vowel position of the tongue. The foreign *w* is the same as the Spanish *b* in *hablar*. Phonetically it is very like *v*, with which it is generally confounded; but *v* is a uni-labial, with "divided" formation; while *w* is a bi-labial, with centre aperture.

Vowels, as we have seen, are throat-sounds which simply pass through the varying mouth-channels; consonants are sounds formed *in the mouth*, as the result of friction, compression, or interception of the breath.

The curves which denote consonants show the part of the mouth at which the compressive or other effect takes place. Thus:

Simple Curves.

I. The Back curve denotes that the breath-channel is contracted between the back of the tongue and the corresponding part of the palate—namely, the soft palate. Thus, c, as heard in *nach* (German) and *laigh* [low] (Scotch).

II. The Top curve shows that the same effect is produced between the middle or top of the tongue and the corresponding part of the palate—namely, the hard palate, or roof of the mouth. Thus, ∩, as heard in *hue*, and in *ich*, (German).

III. The Point curve shows that the same effect is produced between the tip of the tongue and the corresponding part of the palate—namely, the gum, or the front edge of the palatal arch. Thus, ∪, as heard in (theat)*re* (French) and in (th)*ree* [= ∪ſ] (Scotch).

IV. The Lip curve denotes that the compressive effect takes place between the edges of the approximated lips. Thus, ↄ, the sound of blowing to cool.

Mixed Curves.

The Mixed curves denote that the effects of the simple curves are modified by means of the parts of the mouth symbolised in the subordinate curves.

I. The Back Mixed curve shows that the effect of the Back curve is modified by the lips. Thus, ⊂, as heard in *leuch* [laughed] (Scotch.)

Putting in contrast the sounds of the Back and Back Mixed curves, the effect of the Mixed symbol will be clearly apprehended. In passing from one to the other of these sounds, the tongue remains motionless, while only the lips change their position. Thus: ⊂ ⊂ ⊂ ⊂ ⊂ ⊂.

II. The Lip Mixed curve shows that the effect of blowing between the lips is modified by retraction of the tongue towards the Back position, thus creating a large cavity within the mouth, and so changing the sharp blowing sound into a hollow whistling sound. Thus, ↄ wh.

In passing from one to the other of the sounds denoted by the Lip and the Lip Mixed curves, the lips remain motionless, while only the tongue changes its position. Thus, ↄ ↄ ↄ ↄ ↄ ↄ.

The reader will observe that the organic arrangements for the two elements, ⊂ and ⊃ are the same, but with this difference, that the consonant constriction takes place at the point indicated by the primary curve; while the sound receives a sort of vowel modification from the organ denoted by the subordinate curves.

The Top Mixed curve denotes that the effect of the simple Top curve is modified by the simultaneous elevation of the fore-part of the tongue. The frictional contraction remains, as nearly as possible, at ○, while the raised fore-part of the tongue gives a new direction to the breath, and changes the sound to ∩ *sh*.

IV. The Point Mixed curve denotes frictional contraction at the point of the tongue, with simultaneous elevation of the middle of the tongue. The effect is to flatten the upper surface of the point of the tongue and to change the dull sibilation of ∪ into the sharp hissing sound of ∪ *s*.

Before proceeding further, let the reader revise the sounds of the eight consonant symbols which have now been analysed:

⊂ *ch* in *nach* (German); *gh* in *laigh* (Scotch).

○ *h* in *hue*; *ch* in *ich* (German).

∪ *r* in *etre* (French); *thr* in *three* (Scotch).

⊃ blowing to cool.

⊂ *ch* in *leuch* (Scotch).

∩ sh.

∪ s.

⊃ wh.

By the simple substitution of *voice* for vocalised breath in forming these eight consonants, the number of elements of this class is at once doubled. The organic actions of the following Voice consonants are in all re-

spects the same as those of their non-vocal correspondents above exemplified:

ɛ *g* in *tage* (German); *r* (guttural).

ɯ *y*.

ɷ *r* (before a vowel).

ɜ *b* in *hablar* (Spanish); *w* in *wie* (German).

ɛ: *g* (German) labialised.

ɯ *j* (French); *zh*.

ɷ *z*.

ɜ *w*.

Divided Curves.

We are now prepared to advance to the next variety of consonants—in which the formative aperture is Divided. The common characteristic of these elements is that the breath issues laterally, and not through a central aperture; and that more or less of an organic flap is heard as the organs are separated. The formative aperture may be on both sides of the central obstruction, or only on one side, without affecting the character of the consonant, which depends on the faint disjunctive flap attending the completion of the consonant action. Of the sixteen Divided consonants, the following six are heard in English:

ω *l* in *else*.

ω *th* in *thin*.

ɜ *f*.

ω *l* in *ells*.

ω *th* (dh) in *then*.

ɜ *v*.

Some critics of this system have disputed the accuracy of the classification in respect to the sound of *l*, because of the pure vocality of that element, as compared with the fricative vocality of *v* and *dh*. The sole cause of the

difference is that, from the pointed position of the tongue, the side apertures of *l* are large, so that the voice passes through them without friction; while the apertures for *v* and *dh* are normally very narrow—or mere chinks. But the apertures of *v* and *dh* may be widened, and their sounds will be then non-frictional, and of a vowel-like purity, resembling *l*; and the apertures of *l* may be narrowed by convexity of the middle of the tongue (ɱ), and then a frictional or buzzing quality, resembling that of *v* or *dh* is unmistakably heard in *l*. The common "divided" character of the formations, *l*, *th*, *f*, and *v*, is one of the discoveries of "Visible Speech"; and the reality of the relation cannot be called in question by any capable and unprejudiced phonetician.

Other consonants, as well as those of "divided" formation, may have their apertures similarly varied. Thus ʒ (*zh*) yields a non-fricative sound, resembling the consonant *y*. This widened *zh*—which would be written ʒʏ—is, by the way, the element heard in the ordinary American pronunciation of the consonant *r*.

The sounds of the whole series of Divided consonants may now be illustrated:

ɛ hiss of water-fowl.	ɛ the same labialised.
ɱ defective form of *s*.	ɱ *ll* [Welsh].
ɯ *l* in *else*.	ɯ *th* in *thin*.
ɜ *f*.	ɜ *f* [gutturalised].
ɛ *l* in *laodh* [Gælic].	ɛ the same labialised.
ɱ *gl* Italian; *l* Irish.	ɱ *l* [Zulu]; fricative *l*.
ɯ *l*.	ɯ *dh* [*th* in *then*].
ɜ *v*.	ɜ *v* gutturalised.

Shut Curves.

The next variety of consonants are shut formations, which have no outlet for breath or voice. The non vocal elements of this class are only audible in the percussion which attends the separation of the organs. When an emission of breath accompanies the separation, there is a slight hiatus between the consonant and a succeeding vowel; as in the Irish pronunciation of such words as *come, time, pen.* In ordinary utterance, the percussion is due merely to pressure on the breath within the mouth, and there is no emission from the throat. Let the reader test his power of producing the English Shut consonants *k, t, p,* with vigorous percussion, both with and without emission. Thus:

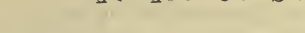
With: ɑ>, ʊ>, ɒ>; *Without:* ɑ>, ʊ>, ɒ>.

The non-emissive formation possesses important advantages to speakers and singers. It leaves unimpaired the clearness of the voice; it tends to distinctness of articulation; and it is unfatiguing in prolonged or energetic effort.

The means by which these modes of pronunciation are graphically distinguished may now be explained. An arrow-head pointing to the right is the symbol of expiration; and a dot denotes the stoppage of the breath. The compound symbol >, consequently, means an effort of expiration but without emission. The dot alone after *p, t,* or *k* would denote the stoppage of the breath by means of the organ symbolised—in other words, the first half of the consonant, without organic separation. Thus: ɒ· ʊ· ɑ· The consonant itself, without additional symbol, is held to imply organic separation, as a necessary part of the element.

The arrow-head symbol is also used in the converse direction. When turned to the left (<) it denotes inspiration. The compound symbol <, consequently means an effort of inspiration, but without inhalation—in other words,

suction. The latter is the mode in which the peculiar clicks or clucks of some languages are formed; such as:



One would scarcely expect that such sounds as these could combine without hiatus with the ordinary elements of speech; yet they do so, with perfect fluency; being merely mouth sounds, independent of any emission either of voice or breath.

The sounds of the four non-vocal Shut consonants are:

k.

a sound between *k* and *t.*

t.

p.

We come now to the sounds of the Shut Voice consonants:

g (hard).

a sound between *g* and *d.*

d.

b.

The formation of these consonants is in all respects the same as that of the preceding set of elements: the sole difference being that the material acted on is voice, instead of unvocalised breath. When the mouth is in any shut position, the voice can only be continued until the cavities behind the point of closure are full. This is a mere instant. The vocal murmur in Shut consonants is therefore incapable of prolongation.

The separation of the organs to complete the consonant is attended with the same percussion as in the non-vocal elements; and the percussion may be either emissive or non-emissive—the latter being, as before explained, the preferable mode.

The agent of percussion, in these as in all consonants, is not the chest, but the cavity between the windpipe and the articulating organ. We often see the lips and cheeks inflated in the pronunciation of *p* and *b*; but this is a mechanical fault. The whole force of articulative compression should be in the pharynx. This cavity has been already described as communicating below with the windpipe, in front with the mouth, and above, with the nose. The soft palate, which hangs like a curtain at the back of the mouth, is the nasal valve; when it is lifted it covers the entrance to the nasal passages; when it is pendent, it uncovers the entrance. When only the top of the soft palate is depressed, the voice, or breath, issues partly through the nose and partly through the mouth—as in forming nasalised vowels. When the mouth-passage is shut—as in forming the English nasal consonants—the breath or voice is emitted through the nose alone. The action of the soft palate is, thus, the sole cause of the difference—great though it is phonetically—between the Shut and the Nasal Consonants. These latter elements come now to be explained:

Nasal Consonants.

Any consonant may be nasalised, but only Shut formations can be altogether nasal. The series of nasal consonants includes:

Non-Vocal.	*Vocal.*	
ɢ	ɢ	*ng*
ɑ	ɑ	a sound between *ng* and *n*
ʊ	ʊ	*n*
ɔ	ɔ	*m*

The non-vocal nasal consonants have not, generally, been recognised as elements of speech; notwithstanding the fact that they are of very frequent occurrence in the conversational pronunciation of our own language. In themselves, they are scarcely audible, being destitute either of friction or percussion; but they have an unmistakable effect in words—producing a sort of hiatus between a vowel and a consonant; as in:

se^{n}se, ny^{m}ph, i^{n}k, tha^{n}k, se^{n}t, wa^{n}t, la^{m}p, ro^{m}p.

The pronunciation of vocal nasals in such words—except in oratorical utterance—is peculiarly un-English. Let the reader pronouce the words in both ways, and he will observe the extreme brevity of the customary English syllables, as compared with the foreign effect due to the long and sonorous vocal Nasals.

The same cause that makes the non-vocal Nasals so faint in sound gives the vocal Nasal consonants a fulness and purity of audibility which renders them the most beautiful and expressive elements in speech. The voice passes without friction through the pharynx and the nose, and is as clearly resonant as in a vowel. For this reason, these elements have been called "semi-vowels"—a term, however, of no practical utility. *L* is equally entitled to be similarly classed; but not the consonant *r*, although it has been commonly included by grammarians. R, in certain positions, has a true semi-vowel sound; but then it is not a consonant. It is a "Glide." *L*, *m*, *n*, and *ng* never cease to be consonants in any position.

In finishing the Nasal consonants, when final in a word, a faint organic flap should be heard, like that which attends the completion of a "divided" consonant.

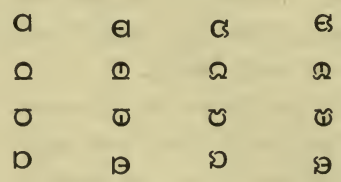
In passing from any Nasal to its corresponding Shut consonant, or *vice versa*, there is no change in the po-

sition of the lips or the tongue. Thus, such combinations as the following are all pronounced without separating the articulating organs:

mp in *ample*	*mb* in *amber*
pm in *topmast*	*bm* in *cabman*
nt in *enter*	*nd* in *under*
tn in *witness*	*dn* in *midnight*
ngk in *anchor*	*ngg* in *anger*

These combinations, on account of their facility in utterance, are among the commonest in all languages.

The attention of the reader may be directed to the uniformity of agreement and of difference among the symbols for the Shut and Nasal consonants, as below collected:



All the consonant actions of the tongue and the lips have now been gone over. The resulting elementary sounds—48 in number—are all represented by only six radically different forms of letters; namely, C C C C O O. There is one other source of consonantal effect—namely, the Throat—the symbols of which remain to be explained.

The first Throat-symbol is O, which denotes a perfectly open condition of the throat-passage, in which ingoing air or outgoing breath receives no frictional effect. The symbol is equivalent to the letter *h*, and signifies a silent emission of breath. The noiseless act of respiration may, therefore, be as distinctly written as any phonetic element of speech. Thus:

O< O, O< O, O< O.

The next Throat-symbol is ◊, which denotes a narrowed condition of the throat-passage, producing the frictional effect called · *Whisper*. This effect may be vocalised, and the result is *Hoarseness*. The symbol for the latter quality is the same as the preceding, with voice-line added. Thus, ⟨◊⟩.

The closure of the throat, by contact of the edges of the glottis—as at the commencement of a cough—is denoted by the symbol)(. The closure may be followed by expiration, as)(>,)(O,)(◊, expressive of effort or pain; or by inspiration, as)(<, a sound of sobbing; or the closure may be unbroken, as)(·. Thus, a cough, a sigh, a sob, a yawn, or a sneeze may be written as clearly as a spoken word.

This throat-"catch" ()() is a common element of speech in some languages. Even in one of the dialects of English—that of Renfrewshire in Scotland—)(is regularly used instead of t, between vowels; as in *butter*, *water*, pronounced bu)(er, wa)(er:—"Pe)(er gaed doon the wa)(er to buy a keg o' bu)(er."

The symbol ⟆ represents the pendulous soft palate, and is hence the sign of nasal quality. This symbol has been already introduced as a part of the letters for Nasal consonants; but it is also used separately, to show the nasalising of any element Thus, a nasalised *y* (ɷ⟆) is a common Polish sound; and nasalised vowels are very frequently used in French—to say nothing of their New England employment.

The compound symbol ⟆ (formed by the union of ◊ and ⟆) is used to denote nasality with guttural compression, as often heard in the pronunciation of the French semi-nasal sounds.

The symbol ⟆ denotes trilling, or vibration of any organ. Thus: vibration of the point of the tongue (ɷ⟆) yields the rough Scotch or Spanish *r;* vibration at the back of the mouth—affecting the uvula—(ϵ⟆) yields the burring *r* of Northumberland and Provence; vibration of the lips (Ɔ⟆)

yields a sound common among cow-herds, as a call to the cattle; and vibration in the throat—affecting the epi-glottis—(ϑʕ) yields the sound of growling.

The means of writing all the normal vowels and consonants of languages have now been described. Four auxiliary symbols are also provided, to indicate slight organic differences from the normal formation of any element. Thus, the sign ˄ ("closer") denotes that the position for the element to which it applies is closer, than the normal formation; and the sign ˅ ("opener") denotes that the position is more open. The sign ˂ ("Inner") denotes that the position is somewhat farther back; and ˃ ("Outer") that it is farther forward than in normal pronunciation. These symbols are seldom necessary in the writing of languages. Their chief value is a scientific one, for the noting of curiosities of sound.

For example, the Back consonants may be formed at any point on the soft palate. The symbols, c ϵ ɑ ɵ, &c., are understood to mean a normal or middle position; and the symbols c˂ ɑ˂, &c., would be used to show a deeper or "inner" formation; and c˃ ɑ˃ to denote a higher or "outer" formation of the same elements.

A characteristic formation of *k* and *g* in such words as *card*, *kind*, *guard*, *guide*, *girl* would be represented by the "outer" sign after the consonant. The intended effect is exaggerated when *e* or *y* is written. The position of the tongue for a Back consonant is usually assimilated to its position for any associated vowel. *K and g*, therefore, before a low vowel would naturally be struck from a low position on the palate; but in the instances referred to they are struck from a high position, as if they were to be followed by an *e* or a *y*.

The following symbols are also made use of in the writing of peculiar sounds and phrases:

ᴄ Inversion of tongue "to back."

ɔ Protrusion of the tongue "to lip."

ˀ Hiatus.

ʘ Whistle.

o or + Sign of connection.

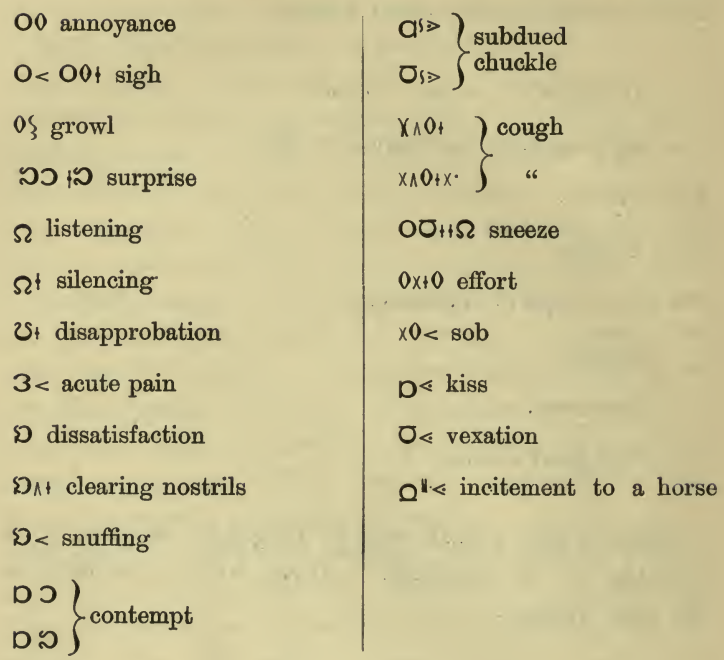
ˈ Accent.

ˌ Emphasis.

ʘ Vocalised whistle.

There is still a small class of Linguistic elements, called "Glides," to be explained. These will be included in the next Lecture.

Exercise on Interjectional Consonant Sounds.

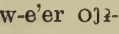


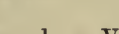
IV.

Vowel sounds are all syllabic. The number of vowels in a word is, therefore, the number of syllables the word contains. But in such words as *buy*, *boy*, *now*, we are conscious of double sounds in single syllables. The second sound after the consonant is not a vowel, because it is non-syllabic; and it is not a consonant, because it has no fricative or interruptive quality. We are forced, therefore, to recognise a distinct class of elements, intermediate to vowels and consonants. These are called *Glides*. A slight prolongation of a Glide converts it into a Vowel; a slight compression converts it into a Consonant.

The English name-sound of the letter I includes two elements—the first, a vowel, the second, a glide—and this double sound is monosyllabic, as in *knife*. In contrast to this, the French compound *ai* as in *náif*, consists of the very same sounds, but is dis-syllabic, because both of its elements are vowels.

In such words as *buyer*, *boyish*, *howe'er*, the *y* and *w* are glides. Contrast the words *coyer* and *lawyer*, *howe'er* and *aware*, and the soft indefiniteness of the glides, as distinguished from the comparative firmness of the *w* and *y* consonants will be readily perceived. Thus:

coy-er  law-yer

how-e'er  a-ware

We see, then, how Vowels or Glides become Consonants, by compression of their formative aperture. The converse is equally true—namely, that consonants of centre-aperture formation become vowels by expansion of their formative aperture. The conversion of vowels into consonants was

shown in last Lecture. The importance of the relation calls for a similar demonstration of the conversion of consonants into vowels. Thus:

I. The Back Voice consonants yields the Back vowels, according to the high, mid, or low position of the tongue in reference to the soft palate. Thus:

ɛ vowelised, becomes ɯ

ɛ› " " ɤ

ɛ‹ " " ʌ

II. The Top Voice consonant yields the High Front vowel. Thus:

ɒ vowelised, becomes ɪ

III. The Top-Mixed Voice consonant yields the High Mixed vowel. Thus:

ɑ vowelised, becomes ɪ̈

IV. The Point Voice consonant yields the Mid Mixed vowel. Thus:

ɷ vowelised, becomes ɵ

V. The Lip Voice consonant yields the High or the Mid Front Round vowel, according to the position of the tongue. Thus:

ɜ vowelised, becomes ʏ or ø

VI. The Back-Mixed Voice consonant yields the Mid Back Round vowel. Thus:

ɛ̃ vowelised, becomes ɞ

VII. The Lip-Mixed Voice consonant yields the High Back Round vowel. Thus:

ːɜ vowelised, becomes ʉ

Glides are represented by a set of distinctive symbols, to prevent all possibility of confusion between syllabic and

non-syllabic sounds. The Glide-symbols are compounded of half of a vowel united to the appropriate consonant curve. Thus:

Glides.

ʅ Back	ʎ Top	ɣ Point	ʔ Lip	ɧ Throat
ʇ B. mixed	ʎ̊ T. Round	ɣ̊ P. Round	ʔ̨ L. Mixed	ɪ Voice

Four Glides, altogether, are used in English; namely:

ɪ Voice Glide: a sound regularly interposed between any "long" vowel and medial *r*, as in *ai* ʌ *ry*, *nea* ʌ *rest*, *fie* ʌ *ry*, *glo* ʌ *ry*, *fu* ʌ *ry*.

ɣ R-glide, or Point Glide: the sound of *r* at the end of a syllable or before a consonant; as in *air*, *ear*, *ire*, *ore*, *our*, *err*, *firm*, *earth*, &c.

ʔ W-glide, or Lip-Mixed glide: as heard in *know*, *now*, &c.

ʎ Y-glide, or Top glide: as heard in *bay*, *buy*, *boy*, &c.

We are dealing here with very delicate shades of sound, such as could not, in fact, be separately illustrated without exaggerating their effect, yet which present most appreciable differences in the combinations of speech. The English *r*-glide, for instance—as in the words *far*, *sir*, *war*—is so entirely transitional that it could not be pronounced alone. When a vowel follows the r, the glide is strengthened into a consonant, as in—

war	ɜ ɟɣ	*warrior*	ɜ ɟɷʃɟɣ
her	oɹɣ	*her own*	oɹɷ ɟʔɷ
far	ɜɟɣ	*far off*	ɜɟɷ ɟɜ

The sound given to *r̀* in America is of a different formation. The glide has the quality of the High Mixed vowel (ɪ̈), or an approximation to the sound of the Top-

Mixed Voice consonant (ɱ). When a vowel follows this *r*, the effect is scarcely distinguishable from that of the consonant *y*. The American *r*-consonant is further peculiarly strengthened by an approximation of the lips; as in "very" (= veɹ̈y). The difference between the American and the English pronunciation of words containing *r* between vowels is strongly marked—as in *carry*, *very*, *spirit*, *sorry*, *hurry*. The English *r* is abrupt and purely lingual; while the American *r* is comparatively long, as well as labialised.

In words containing medial *r* after a "long" *a* or *o*—such as *airy*, *glory*—English usage modifies the vowel sound to a more open than the usual quality, besides interposing a Voice-glide between the vowel and the *r*. In American pronunciation, the vowel has the same sound before *r* as before any other consonant, and the softening glide is dispensed with.

A general principle of Consonant formation is now to be explained. Every consonant consists of two parts.

I. An organic position.
II. An organic action.

The applications of this principle are important to be understood. When any consonant is final in a word, the consonant is finished by completely detaching the articulating organs. When a consonant precedes any other element—vowel or consonant—the organic "action" is not an independent separation, but an opening directly into the position for the succeeding sound. Thus, in pronouncing the word *pity*, the "position" for *p*—one-half of the element—is silently assumed, and the "action" of the consonant consists in opening the lips directly into the position for the succeeding vowel. The second half of the *p*, and the vowel, are therefore phonetically inseparable. So of the letter *t* in the same word; the "position" of *t*—a silent closure by the point of the tongue—is assumed

immediately on the utterance of the vowel; and the "action" of the *t* opens directly into the position for the succeeding sound. The "position" and the "action" are not, however, separated by any pause, but uttered compactly.

The "holding" of any organic position—as in saying pit·ty—constitutes a distinctive mode of pronunciation, which is heard in some languages. Thus, in Italian, the word *ecco* contains exactly the same elements as the English word *echo*, but with the articulative difference that the "position" for the medial consonant is "held" for an instant· This holding of any position has, consequently, a a special symbol ˈ (Holder).

When *t* ·precedes *l* in the same word, the "action" of the *t* does not detach the point of the tongue, but merely removes the sides into the position for *l*; as in *battle*, *mettle*, *little*, *bottle*, *scuttle*. It is evident that a final *t* might be formed in the same way. A symbol for the opening of side apertures is therefore provided. Thus:

‖ Side apertures.

ˈ A single side aperture.

When *t* precedes *n* in the same word, the "action" of the *t* does not affect the tongue at all. The tongue maintains its "Shut" position, while the soft palate opens the passage to the nose; as in *Etna*, *lightning*, *witness*, *fatt(e)n*, *kitt(e)n*, *butt(o)n*. Obviously, a final *t* might be formed in the same way, and such a mode of formation must, therefore, be included as a phonetic element The symbol of nasality written after the consonant correctly depicts this effect. Thus:

Tˌ *t* with nasal finish.

The two varieties of *t*—namely, with side finish (tˈ), and with nasal finish (tˌ)—are not uncommon individual-

ities of utterance among defective speakers; and they may possibly be recognised as characteristics in some language. The combination *tl* is of frequent occurrence at the end of ancient Mexican words. *L*, in this position, as we pronounce the letter, would form a syllable; but, very probably, the effect intended by the Mexican *tl* was merely that a of *t* with side-finish.

This conjecture received an interesting corroboration from the Professor of Scandinavian Literature at Oxford—who recognised the *t* with side-finish as a familiar sound in Scandinavian dialects.

The other Shut consonants—*p* and *k*—are equally susceptible of being finished by the action of the soft palate, instead of by organic separation. The consonant *p* is necessarily so finished in such words as *shopman*, *topmast*, &c. But a final *p* or *k* may be pronounced in the same way. In this case, the sign of nasality after the consonant correctly exhibits the effect. Thus:

P꞉ with nasal finish.
K꞉ " " "

The sound of *ch*, as in *chair*, furnishes an important example of the principle of consonant combination. The first part of the compound is a silent closure by the tongue—in other words, one-half of a *t*—and the "action" of the *t*—its second half—merely opens the aperture for *sh*. Some persons are unable to recognise in the sound of *ch* a union of the two elements *t* and *sh*. They overlook the fact that the first consonant in any combination is never finished independently. The "position" for *t* produces no sound, and the "action" of the consonant is phonetically inseparable from the connected sound of *sh*. The initial element in the word *chew* will be felt to be exactly the same as that in the word *true*. Both, certainly, correspond "to a tee."

The same observations apply to the sound of the letter *j*, which is precisely that of *ch*, but formed with voice instead of unvocalised breath. J commences with the "position" of *d*, and the "action" of the *d* is inseparable from the connected sound of *zh*. The initial element will be felt to be exactly the same in the three words *jew*, *drew*, *due*.

The only remaining variety of speech-elements consists of Tones. All words are uttered with some degree of vocal movement—either from grave to acute or from acute to grave. In this respect, the speaking voice differs essentially from the singing voice, the tones of which are, individually, non-inflected—that is, monotones.

Each of the vocal movements has a meaning which is instinctively associated with the tone by all persons. Thus, when we hear a language which we do not understand, we can interpret the spirit of the speaker by untaught appreciation of his tones. We know when he is dubious or confident, when conciliatory or repugnant, when entreating or mandatory, when his statement is incomplete, or when it is finished.

The existence of dialectic tunes may be supposed to militate against this natural uniformity of tonic expressiveness; but there is, rather, reason to believe that the recurrence of a certain kind of tone in dialects reveals among the speakers a predominance of the sentiment appropriate to the habitual inflexion. A prevalent rising intonation would thus denote a cautious, inquisitive, or querulous disposition; and a prevalent falling intonation would indicate an adventurous, assertive, or domineering temperament.

These extremes of habitual vocal expression are strikingly exemplified in the dialectic tunes of certain districts in Scotland. In one, the rising tone is repeated in clause after clause, and sentence after sentence, with a wonder-

ful degree of monotony; and in another, the falling tone is employed with equal frequency and absence of variety, through the whole current of speech.

Besides dialectic tunes, there are professional tunes, more or less strongly accented, where a mere habit of intonation takes the place of natural expression. We are all conscious of a predominating twang of this kind among speakers of the different oratorical professions; and when we hear a delivery which is free from such blemishes, and governed by natural impulses—whether instinctively practised or artistically acquired—we know that we are in the presence of a master in his department, whatever it may be, legal, clerical, or dramatic. The significance of the vocal movements should be studied as an essential qualification for successful oratory.

The primary meaning of the vocal inflexions is simply to connect or disconnect what has been said, with, or from, what is to follow. The rising or connective tone (/) is thus logically associated with incompleteness of sense, contingency, interrogation, and dubiety; and the falling or disconnective tone (\ ), with completeness of sense, absoluteness, assertion, and confidence.

The tones have also a sentimental expressiveness; the rising tone being associated with sympathy, deference, desire, and all attractive feelings; and the falling tone, with severity, contempt, dislike, and all repellent feelings. A speaker who should use a falling tone with the language of entreaty, or a rising tone with the language of conviction, would be, by every hearer, instinctively felt to be insincere.

The union of the two vocal movements on one syllabic impulse produces a pair of compound inflexions which illustrate the same principles of inherent expressiveness. Simple tones accompany direct and simple language; compound tones accompany language which means more or less

than the words themselves convey. The contrasted tones suggest a contrast in sense between the word used and some other word implied. The law of expressiveness may be thus formulated:

The effect of the last element in the compound is modified by a suggested *antithesis*; which is positive or negative in accordance with the expressiveness of the first element.

Thus, the compound rising tone (∨)—which commences with a fall and ends with a rise—is positive by its commencement and negative by its termination; and its effect is to suggest a positive antithesis. For example, when Brutus says to Cassius: "*I* can raise no money by vile means," he plainly suggests the accusation that Cassius had done so. The insinuation is not in the language, but altogether in the tone with which the word "I" is pronounced. The compound rise is the natural expression of warning, threatening, insinuation, and sarcastic inquiry.

The compound falling tone (∧)—which commences with a rise and ends with a fall—is negative by its commencement and positive by its termination; and its effect is to suggest a negative antithesis. For example, when Nathan said to David: "*Thou* art the man," he plainly referred negatively to the supposititious individual in the parable: "Not the other, but thou." The compound fall is the natural expression of counter-assertion, and of sarcastic affirmation.

One other compound completes the mechanical varieties of vocal inflexion. This consists in the union, on a single syllabic impulse, of a compound fall with a terminal rise (/\/). The tone, therefore, expresses sarcastic interrogation, or counter-assertion with incomplete sense. For example, in this passage:

"One murder made a villain,
Millions a hero,"

the incomplete sense joined to antithesis in the word

"millions" requires the intonation of this expressive "Double Wave."

Some little practice is required to enable the ear to recognise with certainty the nicer shades of vocal inflexion, and to analyse the constantly changing movements of a cultivated voice. Such an analysis would make manifest a principle which is not generally understood; namely, that there is no necessary connection between any given construction of a sentence, and any given kind of tone. Interrogative language is frequently pronounced interrogatively; and imperative language may take either a positive or a negative tone, according to the intention of the speaker. The sense in which we interpret words depends on the tones in which they are delivered. So far, therefore, from Construction governing Intonation, as has been generally taught, the contrary is the fact: that Tones are the governors and interpreters of Language. Hence the necessity of including Tones among Phonetic elements, and the importance of understanding their inherent expressiveness.

The whole scheme of Phonetics is now before the reader. Its details constitute a Universal Alphabet. The system of "Visible Speech"—the symbols of which are here used in exposition of the subject—was first published in 1867. The full effects of the System have not yet been realised; but this much, at least, has been accomplished: that the teaching of articulation, at home and abroad, has been revolutionised in principle, and facilitated in practice; and that the elementary classifications introduced in Visible Speech have been widely, if not universally, adopted in foreign, as well as in English philological works.

The use of the physiological phonetic symbols in common schools will form an era in primary education. This, surely, will not be deferred to a distant future. Meantime,

the symbolic writing has been largely employed in teaching Speech to the Deaf—no longer, of necessity, Dumb—chiefly in the numerous Institutions throughout the United States. Personal instruction was made available there so early as 1871; in consequence of which, the system is, perhaps, better known in America than in its native land. But the great popular field of utility is still unbroken. If this little book shall be honoured by a wide circle of teacher-readers, its perusal may, happily, stimulate them to make experimental applications of Visible Speech in their classes.

From the knowledge of the subject the reader will now have acquired, he will easily conceive how directive the symbols are to those whose ears are shut to sounds. The positions of the tongue—the vocalising or non-vocalising of the breath—the open or shut condition of the nasal passage, and all the minute adjustments on which modifications of articulate sounds depend, are expressed to the eye; so that when the organs are placed in the corresponding position, the sound necessarily follows, without direction from the ear. No difficulty is found in teaching deaf children of six or seven years of age to understand the symbols, and to mould their mouths under their direction with beautiful facility; and when the little ones have not been exactly accurate in their pronunciation of a sound, the teacher has only to write on the blackboard the symbol of the faulty utterance to have the latter spontaneously corrected by the learners themselves. Of course, with the ear's assistance, the effects will be more rapidly and correctly produced; so that hearing children should exhibit still greater facility.

The want of any representative of "Visible Speech" in England, during the years that have elapsed since the publication of the system, has hindered its diffusion in that country; and has also been productive of drawbacks of

another kind. The symmetry of the System has been deformed in republications which have been made without leave asked or given; and these have been accompanied by statements that the original system had been suffered to go "out of print." These facts have only recently been learned.

One emendator, it seems, had supposed the System wanting in symbols for the Teeth; and, accordingly, he actually provided it with a set. "Visible Speech" was, certainly, not born with teeth; or, rather, teeth being in the mouth, their presence is implied, as a matter of course, and requires no symbolising—as they are not in the habit of shifting their root-fast positions. The teeth, like the hard palate, are only passively employed; and it will be time enough to call in dental aid when the teeth are shown to be the active agents in forming any oral sound.

The sufficiency of the Scheme of Symbols was absolutely demonstrated by the exhaustive practical tests in linguistic writing to which the System was subjected before publication; and the sound has yet to be found in any language which cannot be written by the symbols, so as to be reproduced from the writing, with uniformity, by all readers.

The only difference between the *Inaugural Edition*—still "in print"—and the latest publication of the system, entitled "*Sounds and Their Relations*," involves no alteration in a single particular, except an interchange of values between two pairs of the Mixed consonant symbols. These are ʊ ɷ and ω ɯ. Strangely enough, it was by deaf learners—that is, the so-called deaf and dumb—that the desirability of this alteration was demonstrated by their pronunciation of *sh* for the symbol for *s*, and *vice versa*. This unprejudiced verdict was acted on in the assignment of the symbols as shown in "Sounds and Their Relations," and in the present Work. So simple a concession to practical efficiency has, however, been made

the pretext for tampering with the very foundations of the system.

The Physiological Alphabet is not exclusive of new characters, wherever they may be found desirable. The same symbolic elements may be united in other forms, to represent compound sounds—*ch*, *j*, *st*, *ts*, &c. Such contractions, however, are not to be recommended. Simplicity is too grand a quality to be lightly sacrifised.

The fact is curious and interesting that all languages contain many words the sounds of which are suggestive of the objects or qualities denoted by the words. This is a department of Phonetics which has not been much investigated. Does the expressive effect in such words depend on the nature of the articulate combinations—as smooth, harsh, fluent, sonorous, feeble, abrupt, &c.? Or is its source to be found in the very elements of utterance? Has every vowel and every consonant an inherent expressiveness? The affirmative theory is maintained by an author named Upton, whose little-known book—entitled "Physioglyphics"—was published in London in 1844. The same theory is also supported in a book entitled "Glossology," by Charles Kraitsir, M. D., published in New York in 1852.

The views of the first author are developed with a forbidding rashness of assertion, and boldness; and those of the second with an air of dogmatism, coupled with contempt for all gainsayers: yet the illustrations given seem to indicate the reality of an original relation between ideas and elementary sounds. The point should be worthy of unprejudiced investigation.

Science has hitherto done very little for speech. There is a large amount of unused material in simple monosyllabic combinations of letters, which might be made available for new nomenclatures, if a scientific basis could be laid down. Electricity has recently introduced the terms

erg, ohm, volt, watt, farad, &c., commemorating in this way the names of distinguished philosophers (Volta, Watt, Faraday, &c.), but this source of nomenclature is too limited for extensive adoption. Thousands of words might be fabricated which could be arranged to convey a systematised series of facts. For example. besides the word *ohm*, we might have, from the combination of the single vowel ō with a final consonant, nine other words, all of which, at present, have no signification. Taking the two ordinary sounds of each of the five vowel letters before single consonants, we have upwards of one hundred syllables of which we make no use. Syllables with vowels after consonants, and with vowels between consonants, add many hundreds to this now superfluous speech-material. In this direction, possibly, lies an important future for the Science of Phonetics.

We cannot take up a book of travels, and scarcely a newspaper, without meeting with proper names the sounds of which we can only guess at, owing to the indefiniteness of value of the letters by which they are written. A few years ago the name of the deposed Zulu king—spelled C e t e w a y o—was in every newspaper, and it would have been on every tongue if people had known how to pronounce it. Some began it with the sound of S, some with that of Ch, some with that of K; some made it four syllables, and some made it three. The readers of the London "Times" were partially relieved from perplexity by a kindly phonetician, intimating that K was the true initial sound, and that the number of syllables was properly three. The pronunciation of the "te," however, this African scholar could only describe as resembling that of the English *ch;* but the true sound turns out to be one of the African clicks; which makes the name K e t ≪ w a y o. An officer who had been in the suite of the unfortunate Prince Imperial in Zululand,

states that the King's name was simply T ≪ w a y o, and that the initial "Ce" had been added by Europeans in their sheer inability to write the native sound.

In a recently published volume of the "Library of American Aboriginal Literature" the following passage occurs:

"The significance of the name Y u t c h i by which this people calls itself is unknown. All the surrounding Indian tribes call them Y u c h i, with the exception of," &c.

Now, what is the intended phonetic difference between Yutchi and Yuchi? We write *ch* in *much* and *tch* in *match* to denote the very same sound. English usage, therefore, furnishes no guide. Dots and other diacritic signs are often put on letters in foreign words, but their only indication is that the letters have some other than their ordinary English sounds. In all such cases the exact pronunciation might be shown—within brackets or in a footnote—and the reader's interest would be vastly increased. Foreign words might then be printed in the text without defacing marks, and a translation into phonetic letters appended.

One striking point in connection with speech calls for a single observation before concluding, namely, the power of speech-reading by the deaf from watching the motions of the mouth. This is a very remarkable power, considering the facts that some of the articulative actions take place at the back of the mouth and are invisible, or very imperfectly seen; and that nearly all the visible motions of the lips and tongue are subject to ambiguity. P, B and M, for example, are to the eye exactly alike; so, also, are T, D, and N; K, G, and Ng; F and V; S and Z; Ch and J; and some others. The change from a Shut to a Nasal consonant, or from a Nasal to a Shut, is entirely invisible; so that *lamb*, *lap*, and *lamp*; *hid*, *hint*, and *hidden*; *mine*, *might*, and *mind*; *mid*, *mit*, *mint*, and *mitten*; *sat*, *sad*, *sand*, and *sadden*, are altogether indistinguishable to sight. Notwithstanding these difficulties, many deaf persons understand

nearly all that is said to them. In this they are, of course, guided by context. But they require a very extensive acquaintance with words, and with the constructions of language, as well as an accurate knowledge of the mechanisms of speech—and, added to these, a high degree of intellectual ability and promptitude—to enable them to gather context under such circumstances.

The end to be attained is, however, worth the indispensable preliminary labour. Social communication is one of the chief blessings of life. We find that, even to the deaf, a study of Phonetics is possible. How much easier is it to those who are blessed with a sense of hearing! Let us not, then, grudge the pains required for a mastery of the Art and Science of Phonetics—not only that we may speak effectively to fellow-countrymen, but that we may extend our power of social communication to our fellow-men throughout the world.

APPENDIX

ON THE

PHONETICS OF ROMAN LETTERS.

I.—*VOWELS.*

SINGLE LETTERS.

A. The name of this letter includes the sounds of the Mid Front vowel and the Top Glide (ɪɤ).

The letter A has nine sounds in English syllables; as in

play ɪɤ, care ɾ, any ɾ, add ɾ.
[play]mate ɾ
orange ɾ, a ɭ, path ɟ, arm ɟ.
all ɬ
swan ɬ

E. The name of this letter is the sound of the High Front vowel ɾ.

The letter E has eight sounds in English syllables; as in

eve ɾɬ, England ɾ, the ɾ, ere ɾ.
secure ɾ
ever ɾ, err ɻ, sergeant ɻ, righteous ɷ.

I. The name of this letter includes the sounds of the Mid Back Wide vowel and the Top Glide (ɟɤ).

The letter I has six sounds in English syllables; as in

ice ɟɤ, police ɾ, ill ɾ, bird ɻ.
soldier ɷ, [mill]ion ɷ.

O. The name of this letter includes the sounds of the Mid Back Round vowel and the Lip Mixed Glide (ɬɞ).

The letter O has nine sounds in English syllables; as in

{ ode ɟɟ, ore ɟ, { orb ɟɣ, do, ɫ wolf ɫ.
{ o[pinion] ɟ, { on ɟ.
{ word ɟɣ, women ʃ, accompt ɟɟ, one ɜɟ.
{ son ɟ

U. The name of this letter includes the sounds of the Top Voice consonant (ɷ) and the High Back Round vowel (ɫ), forming the syllable *y o o*.

The letter U has eight sounds in English syllables; as in

use ɷɫ, cure ɷɫ. rule ɫ, bull ɫ, { urn ɟɣ.
{ up ɟ.
busy ʃ, bury ɩ persuade ɜ.

Y. The name of this letter includes the consonant W and the name-sound of the letter I (= wi); but Y is never so pronounced in any syllable.

The letter Y is used to represent three vowel sounds; as in

my ɟʌ, hymn ʃ myrrh ɟ.

W. This letter is never used alone to represent a vowel sound, in English; but both W and Y are common orthographic elements in vowel notation; as in

day	they	joy	buy
law	few	how	know

In the preceding illustrations the same sounds occur, in several instances, under different letters. In the following Table the various sounds are collected. The Table shows that a total of eighteen vowel sounds, as well as three consonant sounds, are denoted by the six letters A E I O U Y:

ʃ	ʃ	ɩ	ɩ	ɩ	ɩ	ɫ	ɩ	ɟ
eve	ill	play-	care	any	add	the	a	err
secure	England	mate	ere	ever		orange		bird
police	women			bury				myrrh
	busy							
	hymn							

⌋	⌋	⌋	⅂	⅂	⅂	⅂	⅂	⅂
urn	path	arm	do	wolf	ode	ore	all	orb
up	ice	sergeant	rule	bull	opinion		swan	on
word	my		use	cure				
son	accompt							

ⓜ	ⓜ	ⓔ
soldier	righteous	one
	million	persuade

COMBINATIONS.

The five vowel letters, A E I O U, together with the auxiliary letters, W Y, are used in a great variety of combinations in English syllables, as exemplified in the following list:

Aa. Aaron ⌈ Isaac ⌊
Æ. Cæsar ⌈
Ae. aerie ⌈ aer ⌈ aerial ⌈⌈ Israel ⌈⌈
Ai. ail ⌈ʌ air ⌈ said ⌊ plaid ⌊ captain ⊤ aisle ⌋ʌ
Ao. gaol ⌈ʌ extraordinary ⅂ Pharaoh ⅂ chaos ⌈′⅂
aorta ⌈⅂′ Aonian ⌈⅂
Au. gauge ⌈ʌ aunt ⌋ aught ⅂⅃ laurel ⅂ hauteur ⅂
Aw. awful ⅂ away ⌊ⓔ
Ay. lay ⌈ʌ prayer ⌈ says ⌊ Monday ⌈ ay ⌋ʌ
Aou. caoutchouc ⌋ʒ
Awe. awe ⅂⅃
Aye. aye ⌈ʌ gayety ⌈⊤ gayest ⌈⌈
Ea. each ⌈ great ⌈ʌ wear ⌈ health ⌊ earl ⌊ heart ⌋
guinea ⌈ create ⌈⌈′ react ⌈⌊′ area ⌈⌊ idea ⌈′⌊
Ee. bee ⌈ breeches ⌈ re-enter ⌈⌊′
E'e. e'en ⌈ ne'er ⌈
Ei. ceil ⌈ veil ⌈ʌ heir ⌈ heifer ⌊ height ⌋ʌ
forfeit ⊤ re-imburse ⌈⌈
Eo. people ⌈ leopard ⌊ George ⅂ dungeon ⌉
feod ⓜ⅂ theology ⌈⅂′ creole ⌈′⅂
Eu. rheum ⅂ feud ⓜ⅂ amateur ⌊ [ɛ *French*].
Ew. shew ⅂ grew ⅂ dew ⓜ⅂
Ey. key ⌈ prey ⌈ʌ eyre ⌈ monkey ⌈ eying ⌋ʌ
Eau. beau ⅂ʒ beauty ⓜ⅂

Eoi. burgeois ⱘⱥ
Ewe. sewed ⱘⱢ brewed ⱡ sewer (drain) ⱡ ewe ⱬⱡ
Eye. keyed ⱄ surveyed ⱅⱥ eyed ⱐⱥ
Ia. parliament Ⱡ mediate ⱄⱅ trivial ⱄⱡ hiatus ⱐⱥⱅ′
Iambic ⱐⱥⱅ′
Iæ. minutiæ ⱬⱄ
Ie. field ⱄ sieve ⱄ friend ⱅ die ⱐⱥ series ⱄⱠ
veriest ⱄⱅ earlier ⱄⱣ science ⱐⱥⱅ
Io. motion ⱡ mediocre ⱄⱘ mediocrity ⱄⱘ violence ⱐⱥ′ⱘ
Ionic ⱐⱥⱘ′
Oa. oar ⱘ boat ⱘⱢ broad ⱘⱡ groat ⱘ cupboard ⱡ
oasis ⱘ′ⱡ coagulate ⱘⱅ′ coarct ⱘⱐ′
Oe. doe ⱘⱢ shoe ⱡⱡ poet ⱘ′Ⱡ coeval ⱘⱄ′ oboe ⱘⱥ
Oi. connoisseur ⱅ avoir[dupoise] ⱡ coin ⱘⱥ stoic ⱘ′ⱄ
doing ⱡ′ⱄ choir ⱗⱐⱥ memoir ⱗⱘ
Oo. blood ⱐ door ⱘ brooch ⱘⱢ bloom ⱡⱡ book ⱡ
zoology ⱘⱘ′ zoological ⱘⱘ
Ou. four ⱘ soul ⱘⱢ through ⱡⱡ would ⱡ bought ⱘⱡ
cough ⱘ young ⱐ
Ow. know ⱘⱢ knowledge ⱘ bellows (n) ⱡ now ⱐⱢ
Oy. boy ⱘⱥ
Ua. guard ⱐ piquant ⱅ guano ⱡⱐ′ quack ⱗⱅ squall ⱗⱘⱡ
squat ⱗⱘ persuade ⱗⱅⱥ
Ue. guess ⱅ guerdon Ᵽ rue ⱡⱡ cue ⱬⱡⱡ cruel ⱡ′ⱅ
duel ⱬⱡ′ⱅ duet ⱬⱡⱅ′ query ⱗⱄ quell ⱗⱅ
Ui. mosquito ⱄ build ⱄ guide ⱐⱥ fruit ⱡⱡ fruition ⱡⱄ′
suit ⱬⱡⱡ aguish ⱬⱡⱄ suite ⱗⱄ quill ⱗⱄ quire ⱗⱐⱥ
squirt ⱗⱣ
Uo. liquor ⱡ quote ⱗⱘⱢ quorum ⱗⱘ quondam ⱗⱘ
duo ⱬⱡ′ⱘ
Uu. duumvirate ⱬⱡⱐ′
Uy. buy ⱐⱥ plaguy ⱄ colloquy ⱗⱄ
We. answer Ᵽ
Wo. sword ⱘ two ⱡⱡ twopence ⱐ
Ye. dye ⱅⱥ dyer ⱐⱥ′Ᵽ hyena ⱐⱥⱄ′
Ieu. adieu ⱬⱡⱡ lieutenant ⱅⱓ
Iew. view ⱬⱡⱡ
Iewe. viewed ⱬⱡⱡ
Iou. cautious ⱡ
Œu. manœuvre ⱡⱡ

Ooe. wooed
Owa. towards.
Owe. owed lowest vowel
Uay. quay
Uea. squeak
Uee. queen
Ueu. liqueur (£ *French*).
Ueue. queue
Uoi. turquoise quoit
Uoy. buoy
Uoyed. buoyed

SILENT LETTERS.

Final E is generally silent, although it is not without significance, because it shows that the preceding vowel has its name-sound; as in trade, gate, sake, sale, same, sane, mete, eke, scheme, scene, ride, rite, like, file, time, fine, ode, coke, pole, dome, lone, note, duke, fume, mute, mule, nude, tune. There are, however, many exceptions; as in

have, bade, give, live (v) love, gone, some, etc.

The letter E, in the termination ed, in verbs, is silent, except when the verb ends in T or D.

The letter U, in guerdon, guess; guide, plague, is silent but significant, being used to show that the G has its "hard" sound.

The letters UE in harangue, dialogue, &c., are not only silent, but without significance.

PHONETICS OF ROMAN LETTERS.

II.—*CONSONANTS.*

B. This letter represents the sound of the Lip Shut Voice consonant ʙ. It denotes no other sound.

B combines with l, r, w, y; as in blight, bright, buoy, beauty.

B unites with no initial consonant in the same syllable.

B is silent in dumb, debt, bdellium.

The sound of B is represented by b, bb, be, pb; as in crab, ebb, globe, cupboard.

C. This letter is very variously used. It has the sound of S in cell, city, circle; of K in cat, cot, cut; of SH in special, vicious; and of Z in sacrifice (verb).

C (=K) combines with l, r, y; as in clew, crew, cue. It unites with no initial consonant except S, as in scale.

C (=S) combines with no other consonant in the same syllable.

C is silent before k, q; as in back, acquire; also in Czar, indict, muscle, science.

The combination CH has the sound of K in character; SH in chaise; TSH in church; and J in sandwich. Ch is silent in drachm, schism, yacht.

D. This letter represents the sound of the Point Shut Voice consonant ɒ. It denotes, also, the sound of T in the termination -ed after a non-vocal consonant; as in hoped, chafed, hissed, wished, baked.

D combines with r, w, y, zh; as in draw, dwell, due, jew.

D unites with no initial consonant.

D is silent in handkerchief, Wednesday.

D is represented by d, bd, dd, de, ld, ddh; as in day, bdellium, add, bade, would, buddhism.

F. This letter represents the sound of the Lip Divided consonant ɜ. It denotes, also, the sound of V in of.

F combines with l, r, y; as in flee, free, few.

The sound of F unites (only under the form of PH) with the initial consonant S, as in sphere.

F is never silent except in halfpenny.

The sound of F is represented by f, fe, ff, ft, gh, lf, ph, phe, pph; as in if, safe, staff, soften, laugh, half, camphor, ouphe, sapphire.

G. This letter represents two distinct sounds: one, called the "hard" sound, is that of the Back Shut Voice consonant ɡ, as in get; the other, called the "soft" sound, is the same as that of the letter J, as in gem. G also denotes the sound of ʒ, as in rouge.

The "hard" sound of G is heard regularly (except in the word gaol) before a, o, u; as in gain, gather, go, gone, guess, guard; and the "soft" sound is heard (with many exceptions) before e, i, y; as in gentle, gist, gyve.

G (= ɡ) combines with l, r, y; as in glow, grow, gewgaw. It unites with no initial consonant.

G (= J) and G (= ʒ) combine with no other consonant in the same syllable, except d; as in changed, rouged.

G is silent in seraglio, phlegm, gnomen.

The sound of G (= ɡ) is represented by g, gg, gh, ckg; as in flag. egg, ghost, blackguard.

The sound of G (= J) is represented by g, j, di, ch, ge, gg, dge; as in gesture, jay, soldier, Greenwich, sage, exaggerate, lodge.

The sound of G (= ʒ) is represented by g, j, s, t, z, ge, ss; as in giraffe, jambeaux, leisure, transition, azure, rouge, abscission.

H. This letter represents an emission of breath through a vowel configuration. The breath has the quality of the succeeding vowel; H has, therefore, no uniform sound.

The letter H is used in connection with the letters S. T, W, Z, to denote consonants which are not represented in the alphabet; as SH (ʃ) in show; TH in thin (ω) and

in then (ω); WH (ɔ) in when; ZH (ϡ) in vision. H is also written after P to denote the sound of F, as in phrase, physic.

H is silent after a vowel in the same syllable; as in ah, oh; before a consonant, as in John; in the word thyme; and in the combinations, gh, kh, rh, as in ghastly, khan, rheum.

H initial is silent in the words heir, honest, honour, hour, humour, (not in humor [fluid]), and their derivatives.

The sound of H is represented by h, wh (before o); as in he, hay, high, whole, who, whose, whom.

J. This letter represents the sound of the combination DZH; as in jail, jeer, jilt, joke, jot, just, &c. The letter G has the same sound in age, gender, ginger. J has the sound of Y in hallelujah.

J in French has the sound of ZH; as in jet d'eau (ϡ[ʊʒ)

For the various orthographies of the sound of J see G.

K. This letter represents the sound of the Back Shut consonant ɑ. It denotes no other sound. K is chiefly used before the vowels e, i, as in key, kettle, kind, kitten.

The sound of K is usually denoted by c before the vowels a, o, u, as in cage, cattle, cold, cotton, cube, custom.

The letter combines with no initial consonant except S, as in skate, skeleton, skiff, sky.

K is never used before a consonant in the same syllable. The sound of K in such cases is denoted by c, ch, q, &c.

The sound of K is represented by k, c, q, cc, ch, ck, cq, gh, ke, kh, lk, qu, cch, cqu, que; as in kill, can, quit, account, character, lack, acquire, hough, lake, khan, walk, quay, bacchanal, lacquer, pique.

K is silent in the initial combination Kn, as in knave, knee, knife, knit, know, knot.

L. This letter represents the sound of the Point Divided Voice consonant ϖ. It also denotes the sound of R in colonel.

L combines with the initial consonants p, b, f, c, (=k), g; as in place, blow, flow, class, glass.

L unites with no other consonant.

The sound of L is represented by l, gl, le, ll, ln, sl, sle, tle, as late, seraglio, tale, tall, kiln, island, isle, thistle.

L is silent in calm, salmon. would, walk, half, salve, &c.

M. This letter represents the sound of the Lip Shut Nasal Voice consonant ɱ. It denotes no other sound.

M unites with no initial consonant except S; as in small, smell, smile, &c.

M initial combines with no other consonant except Y; as in music, mutual, &c.

The sound of M is represented by m, n, gm, lm, mb, me, mm, mn, chm, sme; as in aim, Banff, paradigm, palm, lamb, come, common, condemn, drachm, disme.

M is silent in the initial combination MN, as in mnemonics.

N. This letter represents the sound of the Point Shut Nasal Voice consonant ɷ. It denotes, also, the sound of M in Banff; and of NG in ink, anchor, single, anger, &c.

N unites with no initial consonant except S; as in snail, sneeze, snipe, snow.

N initial combines with no other consonant except Y; as in new, neuter, nude, nucleus.

The sound of N is represented by dn, gn, hn, kn, mn, mp, n, ne, nn, sn, sne; as in Wednesday, sign, John, know, mnemonic, compter, dun, done, inn, puisne, demesne.

N is silent in hymn, kiln.

NG. This combination of letters denotes the sound of the Back Shut Nasal Voice consonant ɞ, which has no representative in the alphabet.

The sound of NG is never used at the beginning of a syllable in English; and it unites with no initial consonant.

The sound of NG is represented by n, nd, ng; as in rank, finger, handkerchief, sing, singer, bringing.

The combination of letters NG denotes four sounds: ꞓ in sing; ꞓ ꞓ in single; ꞓ ꞓ in ingress; ꞓ ꞓ ꞓ in change.

P. This letter represents the Lip Shut consonant ꝺ.

P initial combines with l, r, y; as in play, pray, pure.

P unites with no initial consonant except S; as in spare, speak, split, spring.

The sound of P is represented by gh, p, pe, ph, pp, lfp, as in hiccough, pay, tape, diphthong, tippet, halfpenny.

P is silent in the initial combinations pn, ps, psh, pt; as in pneumatic, psalm, pshaw, ptarmigan; and in assumption, bumpkin, cupboard, &c.

Q. This letter represents the same sound as K, but is used only before the letter u; as in quail, queer, quell, quite, quick, quote. The combination Qu in these words has the sound of Kw. In the word quay (=*key*) qu sounds simply as K.

R. This letter represents the Point Voice consonant ω, and also the Point Glide ʏ.

R is sounded as a consonant when before a vowel, and as a glide when before a consonant, or when final.

R combines with the initial consonants p, b, t, d, c (=k), g ("hard"), f, th, sh; as in pride, bride, tread, dread, crow, grow, free, three, shrew.

R initial unites with no other consonant.

R (consonant) is represented by r, rh, rr, rrh; as in rude, rhubarb, mirror, murrhine.

R (glide) is represented by r, er, re, rr, rre, rrh; as in sir, power, fire, purr, parterre, myrrh.

S. This letter represents the sound of the Point Mixed consonant ʊ. It also denotes the sound of Z. as in his, ease; of SH, as in sure, sugar, passion; and of ZH, as in fusion, measure, &c.

S initial combines with p, t, k, f, l, m, n, w, y; as in spy, sty, sky, sphinx, sleep, smoke, snake, sweet, sue.

S unites with no initial consonant.

The letter C, before e and i, has the same sound as S; as in certain, circuit.

The sound of S is represented by c, s, ce, ps, sc, se, ss, sce, tzs; as in cell, gas, ice, psalm, scent, base, loss, coalesce, britzska.

S is silent in chamois, demesne, island, viscount.

The digraph SH is used to denote a consonant sound which is not represented in the alphabet. (See SH).

SH. This combination of letters denotes the Top Mixed consonant ⟃.

SH initial combines only with r, as in shrine.

SH unites only with the initial consonant T, forming the compound sound usually represented by CH; as in chair, chide, choose, &c.

The sound of SH is represented by ce, si, ti, ch, sci, sh, ssi, chs, psh; as in ocean, pension, nation, chaise, conscience, shape, mission, fuchsia, pshaw.

The letters SH denote three sounds: ⟃ in shock; ⟄ in dishonour; ⟅ o in mishap.

T. This letter represents the sound of the Point Shut consonant ⟈.

T initial combines with r, sh, y, w; as in try, chide, tune, twine.

T unites with no initial consonant except S, as in stay, stray.

The sound of T is represented by t, bt, ct, ed, pt, te, th, tt, cht, ght, phth; as in at, doubt, indict, stopped, tempt, granite, thyme, letter, yacht, night, phthisis.

T is silent in fasten, hautboy, mortgage, Matthew, soften, trait.

The digraph TH is used to denote two consonant sounds which are not represented in the alphabet. (See TH).

TH. This combination of letters denotes the Point Mixed Divided consonant ⟉, as in *thin;* and also the Point Mixed Divided Voice consonant ⟊, as in *then.*

TH (=ϖ) initial combines with r, y, w; as in thrive, thurible, thwart. It unites with no initial consonant.

TH (=ϖ) combines with no other consonant in the same syllable, except the inflectional letters d and and s (=z); as in breathed, breathes.

The sound of TH (=ϖ) is represented by h, th, tth, phth; as in eighth, thing, Matthew, apophthegm.

The sound of TH (=ϖ) is represented by th, the; as in this, breathe.

V. This letter represents the Lip Divided Voice consonant ɜ. It denotes no other sound.

V unites with no other consonant in the same syllable except the inflectional letters d and s (=z), as in lived, lives.

The sound of V is represented by f, ph, v, ve, zv; as in of, nephew, vain, have, rendezvous.

W. This letter represents the Lip Mixed Voice consonant ɘ; and also the Lip Mixed Glide ɻ.

W initial is always a consonant.

W (=ɘ) combines with the initial consonants d, q, s, t, th; as in dwarf, quality, sward, twelve, thwart.

The sound of W (=ɻ) unites with the vowel O in the English pronunciation of the name-sound of that letter (ɔɻ); as in know, low, go; and forms, with the vowel ɔ, the diphthongal sound of ou, ow (ɔɻ); as in out, now.

The sound of W (=ɘ) is represented by o, u, w; as in one, persuade, way.

The sound of W (=ɻ) is represented by u, w; as in noun, town. This element is implied as an unrepresented part of the sound of O, as in oh, so, foe, home, sole.

WH. This combination of letters represents the Lip Mixed consonant ɔ, as in what, when, which, why.

WH is used only at the beginning of a syllable. It unites with no other consonant.

X. This letter represents a combination of the letters KS, as in six; of GZ, as in exist; and of KSH, as in anxious.

X initial has the sound of Z, as in xystus, xylography.

The sound of X (=ks) is represented by x, cc, ks, xc, xe, chs, cks, ques; as in ox, accept, works, exceed, axe, stomachs, wrecks, barques.

The sound of X (=gz) is represented by x, gs, ggs; as in exalt, figs, eggs.

The sound of X (=ksh) is represented by x, ct, as in noxious, fractious, action.

For the sound of X (=z) see Z.

Y. This letter represents the Top Voice consonant ⟑, and also the Top Glide ɤ. Y initial is always a consonant.

The sound of Y consonant, [involved in the name-sound of the letter U (=yoo),] combines with the initial consonants p, b, m, t, d, n, k, g, f, v, s, z, th; as in pure, bureau, mute, tutor, duke, neutral, curious, gules, future, view, sue, zeugma, thews.

The sound of Y (⟑(is represented by e, i, j, u, y; as in righteous, million, hallelujah, universe, you.

The sound of Y (ɤ) unites with the vowel ɾ in the English pronunciation of the name-sound of A (ɾɤ); as in able, day, pray, weigh; also with the vowel ɟ in the name-sound of I (ɟɤ), as in idle, high, height; and with the vowel ɟ in the sound of oi, oy (ɟɤ), as in oil, oyster.

Z. This letter represents the sound of the Point Mixed Voice consonant ʊ. It also represents the sound of ZH in azure.

Z unites with no initial consonant.

The sound of Z is represented by s, x, z, ce, cz, ds, sc, se, sh, ss, ze, zz; as in has, xebec, zeal, sacrifice (verb), czar, Windsor, discern, ease, dishonest, scissors, baize, buzz.

A SILENT ARGUMENT.

The preceding lists of sounds, represented by long categories of letters and combinations of letters, stand in strong contrast to the uniformly single qualities of sound denoted by the elements of the physiological alphabet. The complexity and confusion of the phonetics of Roman letters form a silent but eloquent argument in favour of a totally distinct means of symbolising vocal sounds. English literature is indissolubly associated with the prevailing "orthographic" writing. The latter may be retained without disturbance if only we have an interpretive medium of purely phonetic writing, to be used as a key to "orthography." We cannot phoneticise Romanic writing without destroying the visible identity of words. Let us then establish two systems of writing—possessing, besides, the manifest advantage of complete unlikeness—the one, ideographic and classic; the other, phonetic and popular.

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END.

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